



# ARCHITECTURAL RECORD

**11** November 1961

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Below: ALLSTATE INSURANCE COMPANY, Dallas. Architect & Engineer: George L. Dahl. Contractor: Inwood Construction Co. Rotary Oildraulic Elevator sold and installed by Hunter-Hayes Elevator Company.



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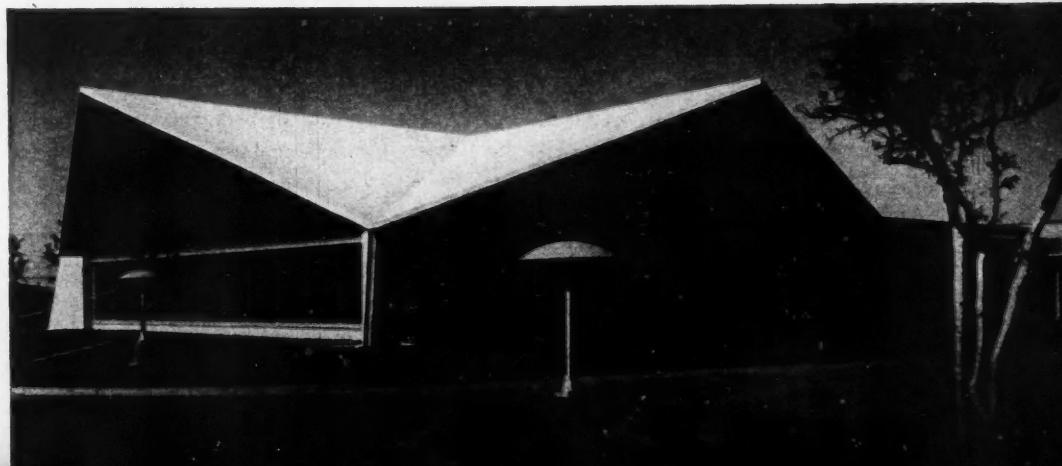
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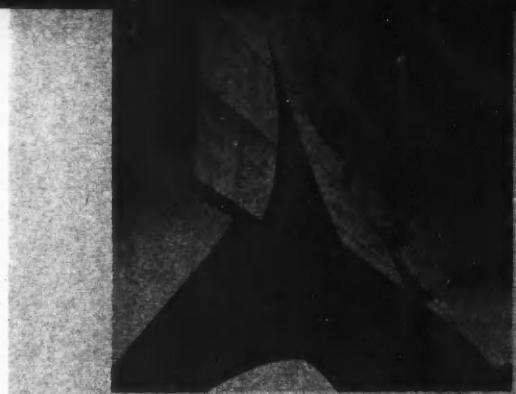
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## ARCHITECTURE FOR A CORPORATE HEADQUARTERS

A mature corporation with buildings of many kinds in many parts of the world may want a special function from architecture when it builds an administrative headquarters for all of its operations. The Upjohn Company did; and its new headquarters on a suburban site outside Kalamazoo, Mich., not only provides effectively for a multiplicity of administrative functions but visually suggests the quiet, competent sophistication of the client. The roof is a steel space frame of considerable technical interest, and next month's RECORD coverage will include technical data on the space frame as well as a major feature on the building.

## CURRENT TRENDS IN HOSPITAL DESIGN

As hospitals continue strong in construction activity, the RECORD plans to present next month a Building Types Study on Hospitals which will examine some of the most important current trends in hospital design, with a group of examples analyzing such trends in current practice—for example, progressive patient care, inclusion of psychiatric units in general hospitals, and the community general hospital for small communities.

## CRITICISM: CHURCH ARCHITECTURE IN ENGLAND

Continuing its series of critiques on architecture around the world, the RECORD will offer a thoughtful article on English church architecture by Peter Hammond, a leading British critic and author of the well-known book Liturgy and Architecture. Some of the directions—many of them rather unorthodox—found by contemporary English architects to express liturgy in architectural terms, and some of the churches which have resulted, will be presented.

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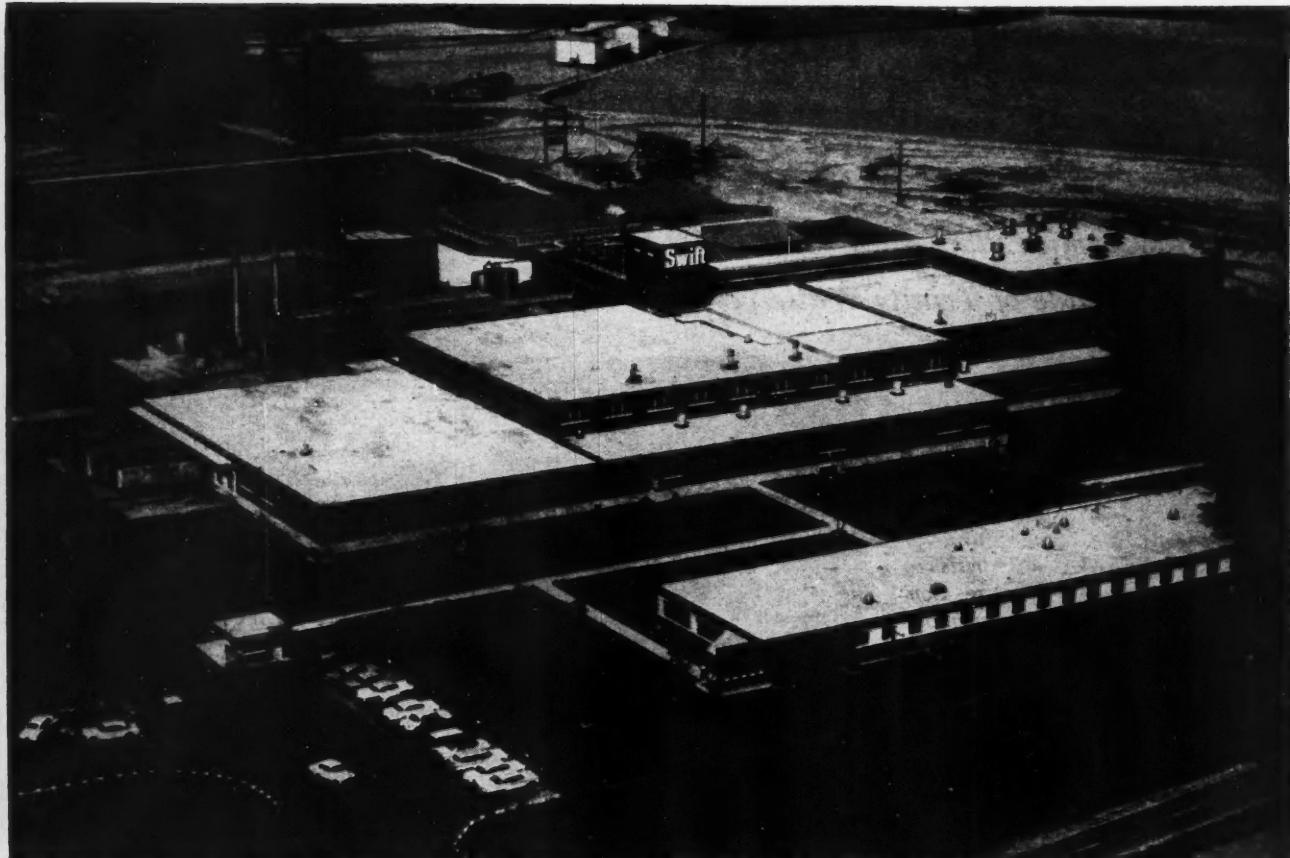


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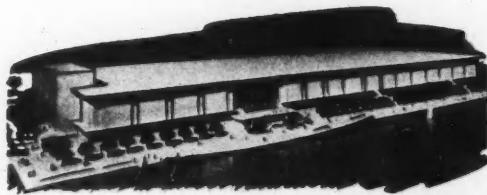
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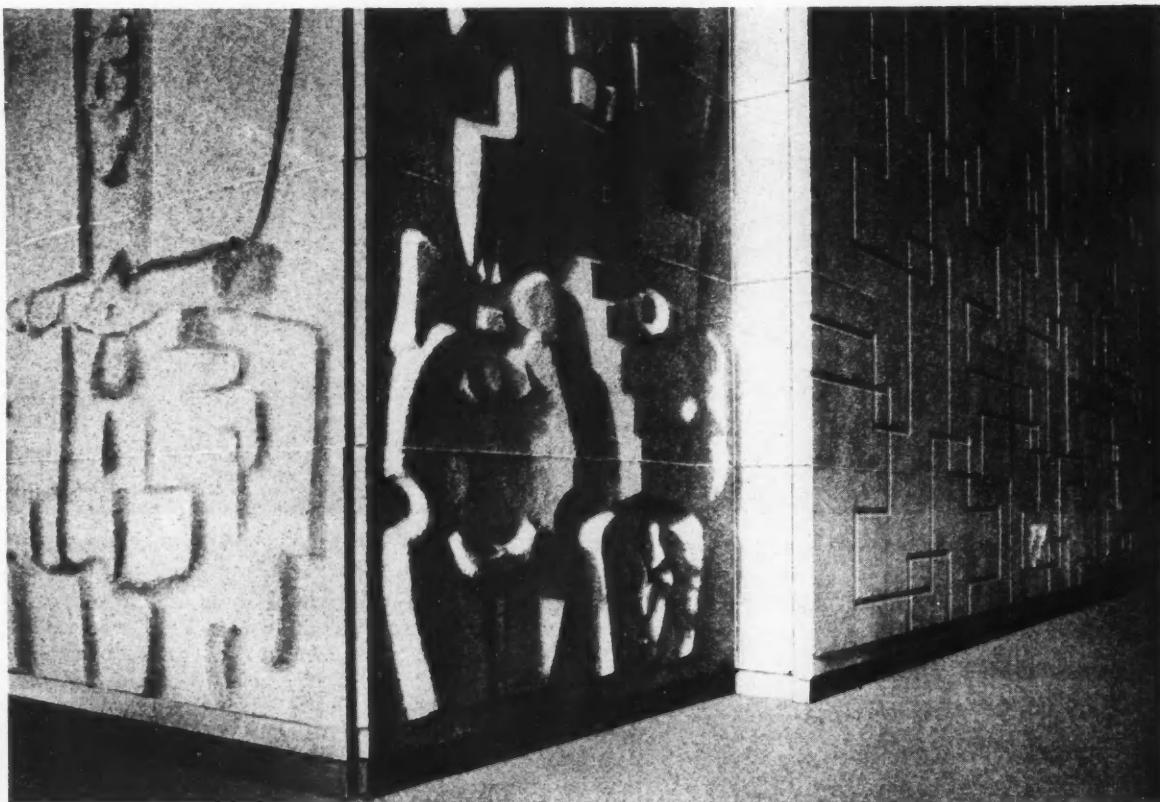
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Construction Outlook for  
**1962** and Beyond

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# PREPAREDNESS AND PROSPERITY

*F. W. Dodge Corporation  
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A YEAR AGO, in this space, we called attention to the fact that 1960 marked the complete and final passage of the postwar period, even for the construction industry.

In view of all that has happened in recent months, what shall we say of 1961, which is neither war, nor peace, nor postwar? A cynic might allege that if 1960 ended the postwar, 1961 began the prewar, period.

For what seem to be good reasons, we will resist the temptation to be cynical. There will be, in the foreseeable future, many elements of a prewar economy influencing the outlook. To say this, however, is not to say that we are in a situation which will lead to actual combat.

An economic forecast today can only make the assumption that there will be no major war. Nonetheless, we can still expect that the nation will prepare for war, on the theory that the best defense is a good offense. And because we will be emphasizing preparedness, it is not too far-fetched to say that we are in a prewar economy, even if we assume that there will not actually be a major war.

The real economic question is, how much preparedness? Obviously, on a temporary basis, a defense build-up can stimulate the economy—particularly an economy that contains some slack, as ours does. At some point, however, large defense programs can impinge severely on the civilian economy, through taxation, inflation, and shortages.

In brief, a certain amount of prewar activity may contribute to prosperity; a greater amount may produce austerity.

No one knows whether tensions will ease or become more severe in the years to come; nothing in the world is less predictable than the mysterious machinations of those who face us across the barricades.

But for the near term—1962, at least—it seems safe to say that things won't get much worse internationally, and that our defense build-up, while intensified, will not produce major economic disruptions. In short, the outlook for 1962 appears to combine preparedness and prosperity.

## *The Garrison State*

We face the prospect of living for an indefinite number of years in something approaching a garrison state. Such a state is one which maintains a constant condition of readiness to defend against instantaneous attack, and to retaliate immediately.

We in America have had relatively little experience

with the operation of a garrison state, although they have been quite common in Europe throughout history. Our geographical isolation in the past has provided a margin of safety from immediate attack which, unfortunately, no longer exists.

Strangely enough, the modern garrison state may have less effect on the functioning of the civilian economy than in the past. In particular, destructive capacity of today's weapons is such that great masses of manpower apparently no longer need to be maintained in a constant state of deployment at strategic points, except as they may be needed for "limited wars."

Nonetheless, there will be (and already are) pronounced effects on the civilian economy. For one thing, manpower in the armed forces is being increased. Since this manpower is generally unproductive in the economic sense, the remainder of the economy must make up the slack by producing for them. Since we have a fairly high level of unemployment, this alone probably will put little strain on the economy; the effect will probably be felt most directly in reduction of unemployment. And there will be some factor of leverage; a hundred thousand men moved from the labor force to the military will have to be replaced by something more than a hundred thousand workers in production for numerous reasons which need not be detailed here.

Since spending for the armed forces is rising perceptibly, and there is a reluctance to increase taxes, we can expect Federal deficits to continue at a fairly high level. The general effect of deficits will be inflationary. While technological advance may tend to keep down commodity prices, other costs, particularly of services, may be expected to rise. The existing tendency of the cost of living to creep up will be intensified by the defense build-up.

During the latter part of 1961, the economy has been in what would otherwise be a more or less normal recovery from the recent recession. The intensified activity on the defense front, resulting from the international situation, is being superimposed on the recovery uptrend.

The combination of the two would seem to insure a high degree of prosperity throughout 1962, at least.

## *A Look at 1961*

When we looked ahead in last year's forecast, we said that a business downturn was clearly under way. We added, however, that it would be "neither very long nor very deep," and predicted that the first half of 1961

would see the low point, with the second half bringing "a decidedly brighter look to the scene."

All these things have come to pass. The Reluctant Recession of 1961 is now merely a wiggle on the charts—and not much of a wiggle, at that. There was a recession, as many a businessman and worker can testify, but it was far from severe for the economy as a whole.

The low point of the recession came in the first quarter of 1961. In that quarter, the Gross National Product dipped to an annual rate of \$501 billion—and paradoxically, still was higher than it had been in the "prosperity" of a year earlier. In January, total employment fell to a recession low of 64.5 million, at the same time setting a new record as the highest January figure in history. Disposable personal income of the American consumer reached a low point in the recession only two tenths of one per cent below the all-time peak.

The impact of the recession does show up clearly in some of the figures, however. In particular, the index of industrial production slid downward through much of 1960, with durable goods bearing the brunt of the decline. Unemployment reached a level of nearly seven per cent of the labor force, and persisted in remaining there long after the recovery had begun. Corporate profits skidded down, although not as sharply as in the 1957-58 recession.

Nonetheless, the recession was brief and fairly mild; and as this is written, a recovery pattern has been in evidence for most of the year.

In addition to the recession, 1961 was characterized by intensification of international crises. Since anyone who reads or listens to newscasts is thoroughly familiar with these developments, it hardly seems necessary to devote any space to a historical review at this point. Obviously, the defense buildup which began in response to threats from abroad has contributed to the economic upturn which was already under way, but as an added push, rather than as a principal factor.

## *Business in 1962*

For a change, it seems fairly easy to predict the short-run outlook for business. The recovery from the recession is still in the early stages, and it would be very strange indeed, in view of past history, if the uptrend did not continue for another year or more. In addition, as we have said, there is the added upward push of the increased defense program.

Thus, practically all competent observers of the scene

conclude that the general business indicators will rise throughout 1962. The "standard forecast"—a term which really signifies the most popular estimate among professional soothsayers—puts 1962 Gross National Product at around \$560 billion, a gain of about 8 per cent over the year 1961. These annual totals mask the true amount of the rise, however. At the low point in the first quarter of 1961, GNP was \$501 billion (annual rate) and by the last quarter of 1962 it may well reach \$570 billion or so, for a gain of about 14 per cent in less than two years.

Similarly, the popular expectation is that the Federal Reserve Board's index of industrial production will average 123 in 1962, a gain of 12 per cent over 1961. Again, however, the total rise may well be from the recession low of 102 (February) to 125 by December 1962, an increase of nearly 23 per cent.

While these are, admittedly, pretty big gains, they are not out of line with the increases that have come after earlier recessions.

Since there is so much agreement in evidence, we should point out that there are a few big question marks, the answers to which will influence the outcome in one direction or another. To take the downward influences first, we may as well recognize that in order to reach the levels indicated, some major sectors of the economy will have to show more strength than they do at the moment.

One of these is consumer spending. The consumer behaved nobly during the recession, keeping his spending above expected levels. But so far, he has shown little sign of a boom psychology, and consumer spending has been something of a laggard in the recovery. Generally, the consumer can be expected to react favorably to prosperity, and he probably will this time—unless some fundamental change has taken place in his attitudes. Some of the economists in our annual survey raise these questions: Is the consumer satiated? Has the international situation affected his morale? Are we shifting from an economy of ostentation to an economy of utility? We are inclined to doubt the validity of these questions, but we could wish for a little more positive confirmation as this is written.

Another sector that will have to increase if we are to achieve the forecast levels is capital investment by business. Capital spending is often a laggard in recoveries, since it waits on improved profit reports; the only thing we can say at this point is that capital spending is certainly lagging at the moment, and the Dodge contract figures through September show no hint whatever of an impending upturn in at least the industrial building portion of capital spending.

Other points causing some wonderment are the possibility of a steel strike in 1962; the danger of another U. S. gold crisis; and whether business plans will be affected by either improvement or deterioration in the relations between business and the Administration.

On the other side of the coin, the question has been raised as to whether the imposition of the defense build-up on top of the recovery may not create a runaway inflationary boom, leading to an even faster climb in the indicators than the standard forecast. Such a prospect raises the specters of boom-and-bust, and of severe restrictions imposed by government.

In view of the fact that the economy still has some slack, and with consumers and business both displaying signs of conservatism, we are inclined to write off this last possibility as very unlikely for 1962. There seems little threat of an inflationary boom in the immediate future, unless of course active fighting breaks out in some corner of the world. A limited war is a possibility which we can neither predict nor rule out; and if one occurs, inflationary pressures, shortages and controls can all be expected in short order.

As things now stand, we estimate that business activity as measured by the major indicators will trend upward all during 1962, with perhaps less rapid increases in the third quarter than in the others, due to the steel strike threat.

Commodity prices will probably not be subject to strong upward pressures in the short run. The cost of living index will continue to rise, however, because of increases in cost of services, where wage gains are less likely to be offset by productivity improvements.

There seems to be no question about the general trend of business. Total activity will reach record heights in 1962, although not every line of business (autos and home building, for instance) will be at new peaks. And the uptrend seems likely to continue all through the year and into 1963.

### *Economists' Opinions about 1962*

The annual Dodge survey of leading economists' opinions is reported in detail in the special review following this article. This year's survey attracted 316 participants, many of whom contributed some cogent comments on the business outlook besides making numerical estimates of the major economic indicators.

In general, the economists are quite optimistic about business prospects next year. The median forecasts indi-

cate substantial growth in total output, and industrial production. New construction expenditures, consumer spending, and outlays for new plant and equipment also are expected to reach record highs in 1962. Some of the anticipated expansion will reflect continuing inflation, as both consumer and wholesale price levels are scheduled to accompany the upward trend in business activity.

The most remarked influence on the short-range outlook was, undoubtedly, government defense policy. The economists agreed that spending for all sorts of military and related goods and services will surge upward next year and provide a special stimulus to the general recovery. In making their projections, most of the economists assumed that the international situation would remain tense but no "shooting war" would evolve next year.

All will not be "sweetness and light" on the domestic scene. The economists noted several areas of weakness or potential weakness which could hinder the business expansion. They also anticipate some slowing in the rate of growth as 1962 matures. Nevertheless, on balance, the year ahead appears to them as a prosperous one with the pluses far outweighing the minuses in the national economy.

### *The Construction Industry*

Having called attention to a couple of places where we were right last year, it is only fair that we correct one slight error. We said, a year ago, in our review, that 1960 marked the first postwar year in which the building business failed to reach new peaks. We were half correct; the government's work-in-place figures did dip for the first time. But our own Dodge contract figures were a little stronger than expected in November and December, after we had made our estimates. The result was that 1960 contracts set a new record, if only by a hair. Since 1961 contracts showed a further gain, the record remains unblemished: there has been an increase in the dollar volume of construction contracts every year since 1946, despite four recessions and a pretty fair-sized war.

Construction in 1961 started off in a deep-freeze. Some of the worst weather in memory affected heavily populated portions of the nation, with heavy snows in the East and excessive rainfall in parts of the South. The bad weather came at the bottom of the business dip, and it may well have made the statistics for construction and many other activities, including retail trade, fall lower than the recession alone would have warranted.

With the arrival of Spring, construction activity thawed out rapidly, with one or two important excep-

tions. Contracts for hospitals, schools, apartments, stores and offices began to show strength early in the year; and in the heavy engineering sector, electric utilities led the way. Single-family housing remained in a rather chilled state for a few months, but began to warm up around mid-year. Highways showed no particular uptrend, but the one consistently bad actor among the major categories was industrial building, which has sagged badly and as yet shows no signs of life.

## *Residential Building*

Residential building is the most-talked about part of the construction industry, and it merits some separate comment. It seems that our estimate for 1961 housing starts made last year will be about in line, and that total non-farm starts will amount to just about 1.3 million. This seems to confirm our conclusion that housing may no longer be counted on to go up in time of recession, or to lead the way to recovery, as it did during the postwar period.

There was considerable improvement in housing starts during the middle of 1961 from the very low levels of the early part of the year. There has been little indication of much further improvement toward the end of 1961, however. Our estimate for 1962 contemplates 1,400,000 non-farm housing starts. This would be an increase of about 8 per cent over the full year 1961. Much of the increase has already taken place, so that the 1962 estimate does not mean a sharp increase over current levels.

Basic demand for housing is not exhibiting any dynamic change, and it is not expected to do so until later in the Sixties. The easier terms of the Housing Act of 1961 should provide some small stimulus; but offsetting this is the prospect of higher interest rates next year. Since housing is coming back into step with the general economy, the prospect of prosperity should be an additional stimulus; but the rising trend in vacancies, particularly in rental units, produces a dampening effect. All in all, we expect a rather modest increase in housing starts next year.

Home improvements constitute one large portion of the rental market which should rise substantially. The Housing Act of 1961 greatly liberalized lending terms for home improvement; and the fact that our housing inventory has been tremendously increased in recent years provides a larger base for home improvement activity.

The impact of fallout shelters is a popular question today. There are no satisfactory estimates of the extent

of this impact. If fallout shelters could be built for as little as \$500 a family, the total cost would be over \$25 billion, or almost half the annual outlay for all U.S. new construction. Obviously, no program of this magnitude will be accomplished in a period of a year or two, no matter how great the need. Any forecast of the fallout shelter market depends on the degree of government stimulus, including tax concessions or subsidies, and the degree of conviction on the part of the public that shelters are either necessary or practical. Our guess—and it is only a guess—is that the impact of fallout shelters will have little noticeable effect on the volume of construction in 1962.

Apartment building has been sharply increasing its share of the housing market for the past several years. While we believe that apartments will continue to account for a large proportion of the market in the Sixties, and possibly even to increase their share, we think that there will be somewhat more strength in single-family homes in 1962, so that the proportion of apartments will fall slightly from the 24 per cent registered in 1961. Since single family units are more expensive, on the average, and since building costs will continue to rise, there will be a greater gain in dollar volume of residential building than the 8 per cent we have estimated in units.

## *Construction in 1962*

Construction contracts will show a substantial gain in 1962. We estimate that total contracts for the year will amount to \$39,961,000,000. This will be another new all-time high, some 7 per cent ahead of the 1961 figure. The reader is reminded that a large part of this gain, at least in the residential portion, has already been achieved in the second half of 1961, and that the increase from the end of 1961 to the end of 1962 will be a somewhat smaller percentage.

The Dodge Index (1947-49 = 100) will average 292 for 1962, as compared with 273 in 1961 and 266 in 1960.

Dollar volume of nonresidential building contracts is estimated to rise 4 per cent in 1962, with the sharpest increase in industrial buildings, but with modest dollar gains in most other categories. Residential contracts should go up 10 per cent in dollars, and total building contracts will rise 8 per cent. Heavy engineering contracts are expected to increase by 6 per cent.

Physical volume of nonresidential building, as measured by floor area of contracts, will be up a little less than dollar volume in percentage terms, due to rising costs.

We put the floor area increase at 3 per cent. Similarly, physical volume of residential building, in floor area, will be up 8 per cent, a little less than the increase in dollars. In terms of non-farm housing starts, as measured by the Census Bureau, we estimate a total of 1,400,000, or an increase of 8 per cent. Total floor area of residential and nonresidential building combined will be up 6 per cent.

The construction market in 1962 will be the largest ever presented to any fabricating industry in history. This, however, is no cause for complacency. The lush years of the postwar period are over, and the real growth rate of the industry, in terms of man hours of labor, or bathtubs, or tons of steel used, is not as great as it was in the late Forties and early Fifties. Considering that the high profit potential of those earlier years attracted large additional amounts of capacity into the industry, the present situation promises no let-up in the intense competition for sales and profits.

Some areas of construction have actually declined. To take perhaps the worst example, the number of single family homes started in 1961 was only about two thirds the number built in the peak year of 1950. A company which has been firmly wedded to the single-family market, and which geared up to 1950 demand, is today very likely to be wondering what hit it. Other shifts are in process or in progress: for example, away from elementary schools toward secondary and college buildings.

There is still an enormous profit potential in the huge construction market. But profits will not fall like ripe apples into the laps of everyone. The profitable companies in the building business will be the most sophisticated ones; those which know the most about their changing markets, and which adapt to these changes most quickly. Never has intelligence been more important—in both meanings of the word: intelligence as information, and intelligence as common sense.

# Nation's Leading Economists See Strong Showing in 1962

*Composite Opinion  
of 316 Leading Economists  
Polled by  
F. W. Dodge Corporation  
in October 1961*

BUSINESS ACTIVITY across the country will forge ahead at a brisk pace during the rest of 1961 and throughout next year. This is the opinion of an overwhelming number of the nation's leading economists replying to our annual survey.

All the major indicators of the national economic health are expected to advance in 1962. Some of them should set new records. For instance, the median estimate of the broadest measure of the economy, the Gross National Product, indicates a rise to \$565 billion by the fourth quarter of 1962, up almost 10 per cent from the second quarter of 1961. The Federal Reserve index of industrial production is scheduled to move into new high ground, too, reaching a level of 122 by December 1962, up over 10 per cent from last June.

It is noteworthy that the rate of increase in the physical volume of production is expected to approximate that of total dollar output or GNP. This seems to reflect a majority opinion that the recovery will continue to be centered in the manufacturing sector of the economy, particularly in durable goods manufacturing. On the other hand, practically all the respondents feel that both consumer and wholesale prices will creep upward in 1962, tending to boost current dollar output relative to physical volume. Apparently, the price effect is thought to be balanced out by greater emphasis on producing goods relative to services, at least for the forecast period as a whole.

Several times in the recent past, the Dodge survey has been conducted in the shadow of a worrisome event or situation that has added to the usual uncertainties attendant to economic forecasting. In 1955, it was President Eisenhower's heart attack. In the early fall of 1957, and again last year, the nation was just entering a recession period. In the fall of 1959, the steel strike hung its pall of gloom over a large sector of the economy. This year, of course, it is the extremely troubled international scene that poses the biggest question mark.

Implicitly or explicitly, most of the economists indicated that their numerical projections were based on the familiar assumption that there would be "no shooting war" during the forecast period. However, many of them qualified this assumption in their written comments. Judging from the tone of these comments, a garrison economy next year, with significant differences from that implied by the numerical forecasts, was felt to be a distinct possibility—and, to a few, a probability. A few respondents noted that even without an outbreak of actual fighting, there is a fair chance of some economic controls being imposed.

Although the economists' specific forecasts did not envision an active shooting match, they certainly reflected the currently high temperature of the interna-

tional situation. Nearly all the economists agreed that Federal defense expenditures will be rising fairly sharply into 1962, and should provide a fillip to the normal recovery pattern. As a short-range stimulant, increased Government spending was mentioned more times than any other single factor.

However, the economists also stressed some other things which they thought would lend support to the outlook for 1962. Among them were: an anticipated build-up of business inventories, particularly in durable goods; renewed strength in plant and equipment expenditures despite excess capacity in many lines; and a fairly good year for nonresidential construction.

Inevitably, of course, our respondents picked out some potentially weak spots in the economy. Prominently mentioned were the following possibilities which, if becoming realities, would act to dampen or distort the business expansion in 1962:

- § Consumer expenditures, already a laggard in the present upturn, not accelerating enough to support the projected levels of total output.
- § Another sluggish housing year.
- § A resurgence of inflation which, if severe enough, could lead to price and wage controls.
- § More aggressive foreign competition and renewed balance of payments problems.
- § A continuation of the uncomfortably high level of unemployment, which would serve as a brake on consumer demand.
- § An intensifying "rift" between the Administration and the business community which could discourage investment and business morale.

To a majority of the economists, 1962 shapes up as a prosperous year, but certainly not one without serious problems as indicated above. Quite a few respondents did mention the possibility of a setback in business activity, if and after government spending hits its peak next year. This was reflected in the median numerical forecasts, according to which, increases in both the two major indicators—GNP and industrial production—will taper off slightly toward the end of next year. But despite some reservations, the majority are definitely optimistic about the overall outlook for 1962. Perhaps their feeling can be summed up in the words of one economist in the manufacturing field:

"Business prospects generally are excellent. The year 1962 should average comfortably above 1961. It must be remembered, however, that most of the high optimism at the moment rests upon the single factor of enlarged government spending, admittedly a powerful stimulant. Nevertheless, it will take a substantial and sustained rise in consumer and business psychology to get overall spending as high as many 1962 GNP estimates now

expect . . . the outlook is bright, but disappointment is in store for those who let their optimism become too strong."

\* \* \*

In passing, it should be noted that the collective record of last year's survey respondents was a fairly good one. Nearly 70 per cent of those replying to the survey for 1961 correctly foresaw the dip in business activity during the forecast period. Moreover, of those anticipating the downturn, 64 per cent placed the low point within one quarter of the actual low (first quarter 1961). The majority of respondents to last year's survey agreed that the 1961 recession would be mild (which it certainly was) and 90 per cent of them expected business activity to be in a rising trend by the fourth quarter this year (which it now seems pretty safe to assume).

We shall not labor the point about the comparative difficulty of *publicly* forecasting downturns as opposed to glowing predictions of prosperity. However, the composite record of our 327 respondents last year does seem to refute the oft-heard charge that economists, as a breed, suffer from "chronic rose-coloring of their crystal balls."

This year, survey respondents again numbered over 300—316 to be exact. Of the total replies, 51 represented financial organizations and insurance companies, 178 were from manufacturing and other business firms, 37 from colleges and universities, 6 from government, and the remaining 44 from consultants or officials of trade and research organizations.

### General Comments

Comments on specific questions are included with the discussion of those questions below. A large number of respondents commented on the general business outlook, and the following quotations are typical of the views expressed.

"The U.S. economy in 1962 will be buoyant, but not booming. While nearly every major sector will be achieving new heights, even after adjusting for inflation, the gains will for the most part tend to be modest rather than spectacular."

"The terrific demands of the cold war, the world-wide brush fires, the space-race, our announced policy of vigilance and preparation for any untoward Communist act must serve as a substantial prop to prices, wages, spending, and consumption."

"Increased Federal spending, higher personal consumer expenditures, and inventory accumulation will lead the economy into new high ground. A higher recovery than we saw after the last two recessions is expected, although a 'superboom' is not anticipated."

"Although my projections are based on a 'no war' assumption, this assumption presently seems weak."

"There is nothing in the cards to indicate that business activity in 1962 will reach boom levels. First, the American consumer is well stocked and bored, to boot, with the unimaginative goods being offered. Secondly, the heavy excess capacity hanging over a number

of important American industries rules out a capital expenditure spurt next year or the year after. Finally, a \$5 billion, or even a \$10 billion increase in defense spending certainly will add to the demand pressures but stepped-up Federal outlays will be largely lost in our vast economy."

"1962—a better year for business—improved corporate profits and personal income—but new inflationary pressures and threats of increased government controls."

"The 1962 economic outlook is strictly A-OK. More people will have more money with which to buy more products than ever before in history."

"Bound to be inflation with war-scare and potential among consumers (good liquid position) for scare buying."

"Federal and state government plans for spending provide the trigger for setting off a short-term boom during the year 1962."

"The belief that the Washington attitude toward business is unfavorable will keep business from strong expansion. The terrific inflationary factors, however, will force a modest increase in all economic segments of the economy. All predictions are off if there is either limited or all-out war."

"The period immediately ahead is certainly one of what one of my friends has choicely phrased 'stabilized uncertainty'."

"The international situation looks worse than it has for a long time. But, barring all-out war, the outlook is for a strong domestic economy."

"The recovery is unusual in that all the major economic forces are advancing simultaneously. Current recovery could reach boom proportions as a result of this fact and the resulting high multiplier effects of large defense expenditures. A large budget deficit in fiscal 1962, if switched to a surplus in 1963, could trigger severe recession."

"Preparedness and armament will expand with increased intensity. Some controls over civilian consumption will be imposed before middle of 1962."

"Rising government expenditures will provide a short-lived stimulus to the economy, followed by moderate improvement in corporate earnings and investment, and resulting in a sated public taking another weak swing at consumption. Needed—a real technological break-through in the consumer area or a powerful motivation to consumer investment."

## *Details of Replies*

The economists surveyed were asked to present specific forecasts for the remainder of 1961 and for 1962 for a number of major economic indicators. Some omitted replies to some parts of some questions, but there were more than 250 replies to each part of every question except the final question on interest rates, where a slightly smaller number replied.

As in the past, we are summarizing the numerical estimates of the economists by using the median estimates and the "50 per cent range"—that is, the range within which the middle 50 per cent of the estimates fall—to give some indication of the divergence of opinions. We have, as usual, included selected quotations from the replies in order to add depth to the numerical forecasts.

### *1. Gross National Product*

The average expectation of the economists is that GNP (in current dollars) will rise steadily throughout the forecast period but with some slight slackening in the rate of growth as the business recovery matures. The median estimate of GNP at seasonally adjusted annual rates ran from \$525 billion in the third quarter of 1961 to \$552 billion in the second quarter of 1962, to \$565 billion in the last quarter next year. In each quarter, the 50 per cent range of forecasts extends further downward than upward. By the fourth quarter of 1962, it reaches down to \$545 billion and up to \$575 billion, which is also the "most popular" or modal figure for that quarter. Significantly, though, only five of the economists put GNP at the end of next year below the \$516 billion rate reported for second quarter 1961. Needless to say, this represents an extremely high degree of unanimity on the general direction of business activity.

A special analysis of individual replies to this question reveals a fairly widespread agreement on the direction of GNP by each quarter of the forecast period. Seventy-seven per cent of the economists expect GNP to increase in each of the six quarters; 8 per cent look for a peak in GNP sometime in the period and a subsequent downward movement; 4 per cent anticipate a rising trend until late 1962, when it should level off; and the remaining 11 per cent either did not complete the question or saw various other patterns.

COMMENTS: "The third quarter of 1961 should complete the recovery phase of the 1960-61 recession. Thereafter, we expect firm economic growth, continuing through mid-1963." / "Attainment of the projected levels depends to a greater extent than usual upon a sustained increase in consumer spending, which in turn depends not so much on measures to increase consumer income as upon consumer reaction to prices and products available for purchase and their desires to save." / "Foregoing the obvious implicit assumptions, this will be one of those fortunate years in which every important sector in the economy will be on a rising trend, leading to a strong cyclical increase in GNP, which will be averaged later into an increasing growth trend." / "Unless serious inflationary pressures develop, which are unforeseen at this time, the rate of increase in total output is likely to taper, particularly in the latter part of 1962." / "In the absence of exceptional labor troubles, I look for a rapid spurt in GNP expansion in the 4th quarter of 1961 as growing inventory, plant and equipment and especially government spending occurs." / "GNP will increase quarter by quarter throughout 1962. However, the rate of increase will slow up after mid-year. Nevertheless, 1962 will easily be the best year to date." / "The rate of GNP expansion will slow down substantially in the latter part of next year, with about 4% the year-to-year percentage gain representing higher prices." / "Sustained growth as a result of massive spending by the U. S. Government for defense, public works and welfare projects." / "The evidence of significant improvement in a wide range of industries indicates that the present recovery probably will be sustained. Heavy defense expenditures will continue to stimulate the economy throughout 1962." / "Barring a worsening of the present international crisis, GNP may be expected to level off at a cyclical peak in the second half of 1962." / "Nothing spectacular—steady growth—no great boom."

## 2. Industrial Production

Industrial production is also expected to show a steady rise next year, according to a majority of the economists polled. The median forecast calls for a seasonally adjusted Federal Reserve Board index of 116 by December 1961, picking up to 120 by June 1962, and reaching 122 in December 1962. This would indicate some slowing in the rate of increase in industrial production particularly late in 1962. The 50 per cent range for this question is quite evenly spread around the median, extending from 118 to 125 by December 1962.

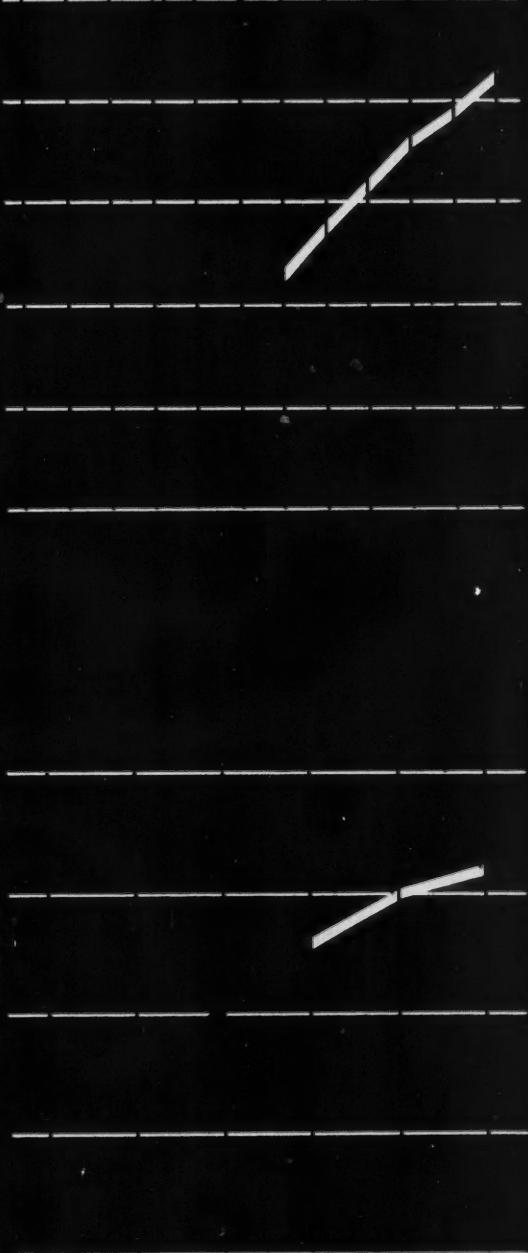
According to our special analysis of industrial production forecasts, 74 per cent of the economists expect the index to rise throughout the forecast period. Six per cent expect a rise, then a level movement, while 13 per cent foresee a rise followed by a dip before the end of next year. This compares with only 8 per cent who look for a dip in GNP and helps explain why the median estimate of GNP increases faster than that of the FRB index during the second half of 1962.

As mentioned before, many of the economists thought the increase in industrial production would be sparked by the durable goods sector. The defense buildup and a better automobile year were considered important contributors to the uptrend in durables.

**COMMENTS:** "The 'durables' component of the FRB index will show the sharpest rise through the 3rd quarter of next year. By year-end, hesitation will be observed." / "Industrial production will follow an upward course over the next 18 months, but there will be a slackening in the growth rate during 1962." / "Further growth is anticipated in the level of industrial production until mid-1962. However, increases during the next several months will be more difficult to come by than in recent months." / "Industrial production will move in step with national product. The general recovery is going to be largely an industrial recovery." / "Government spending for military and space activities and private investments will provide the major sparks." / "Expansion in steel, auto, tires, chemicals, textile products, construction, and defense industries will be most noticeable." / "The most rapid rise in industrial production will probably come in next six months." / "Manufacturing output should continue to rise, with durables production in particular being stimulated by increased defense contracts." / "Durable goods production will give the greatest strength to the rise in industrial production. Non-durables will, however, contribute strongly and their importance ought not to be underestimated." / "Inventory building will be a factor in the first half 1962. Major gains will be in durables, especially if capital spending comes alive." / "Production expansion throughout industry should be general and steady for at least the next four quarters."

## 3. Consumer Prices

"More of the same" is the almost unanimous feeling of the economists in regard to the trend in consumer prices. The consumer price index stood at 127.6 in June 1961, and the median forecast is that it will rise 2.5 per cent to 130.8 by December of next year. For that month, the



50 per cent range is quite small, running from 130.0 to 132.0. Only one per cent of the respondents thought the price level at the end of next year would be down from the mid-1960 mark. This compares with 11 per cent who so opined in last year's survey in regard to 1961.

Although few economists predicted the price "creep" would turn into a "gallop," inflation is expected to be more of a problem next year. Defense spending, domestic politics, and the rising cost of services were blamed for part of anticipated increase. However, the uptrend in general business activity, by itself, is expected to provide sufficient stimulus to keep the price level advancing.

**COMMENTS:** ". . . Price increases will pick up steam in 1962." / "Inflationary pressures will become increasingly strong as our productive plant nears capacity." / "The upward drift will continue as the result of inflationary policies of the government and the cost-push effects of union wage pressures." / "The increase in farm prices as a result of government subsidy will be reflected in higher consumer prices. This increase will be significant in the first half of 1962, and after that should be relatively stable." / "The likelihood now appears, thanks to the Administration's policy of softness toward labor and stern demeanor toward business, that prices must rise fairly sharply." / "By year end I expect a steel price jump despite Mr. Kennedy's wishes. This will encourage a new round of price and wage increases of a moderate nature." / "Our total economy is once again leaning toward a strong inflationary bias and this will be increasingly reflected in successive price increases in 1962." / "Prices may be expected to rise more steeply under a government whose first sympathies seem to be with unions." / "Higher demand and increased costs of services, in particular, will exert an upward influence on prices in the non-farm sector." / "Inflation will accelerate due to defense expenditures." / "No inflationary spiral is foreseen because of the excess productive capacity in the economy." / "Consumer prices will outpace the rise in wholesale prices as they have done in the past."

#### 4. Wholesale Prices

Wholesale prices are also predicted to move up in 1962, according to a consensus of economists polled. The median estimate of the wholesale price index for December 1962 settles on 120.8, which would represent a 2 per cent increase from last June. Again, there is little spread in the 50 per cent range. It extends only from 120.0 to 122.0 at the end of next year.

Reasons given for some resurgence in wholesale prices, after more than three years of comparative stability, include the defense build-up, expected strengthening in farm product prices, and the general economic recovery. Cited among the factors that should keep wholesale price increases moderate are ample capacity in many industries and intensifying foreign competition.

**COMMENTS:** "Wholesale prices will soon reverse their recent downward direction. Increases during the following months will be rather mild at the beginning but more pronounced as the economy approaches full employment levels." / "It appears that with a lagging demand for raw materials and a general over-supply situation

in nearly all sectors of the economy, wholesale prices will show only a weak tendency to rise in the latter half of the year and early 1962. The degree of this index movement will depend quite likely on the trend in the international commodity markets and future developments in the international situation." / "Wholesale prices are certain to rise the closer we come to near-capacity operations in our industrial sector." / "World wide competitive conditions will moderate any real price increases, especially in raw commodities." / "Strengthening farm prices to match continued lack of strength or softening in non-farm prices." / "Wholesale prices have been declining since early 1960 due to farm product price decreases. The trend is due for a reversal." / "Wholesale prices will increase from now through all of 1962, penetrating the 120 level around January 1962, and the rate of increase in the second half will be less than the first half." / "Three years of stability in industrial prices likely to give way to modest uptrend over the next year. Barring more drastic defense build-up, I see no danger of classic demand-pull inflation." / "Wholesale prices probably will show some advance, after 3½ years of stability. Upward price pressures will result from a turn in the livestock cycles, higher agricultural support prices, strong export demand, and a rise in domestic investment demands." / "Ample supplies of many commodities as well as foreign competition (witness the recent price cuts in aluminum and some steel items) should act to brake any substantial upturn in wholesale prices." / "The Administration's position to use moral suasion to hold the line on prices will reduce the pressure for raising prices. This position, coupled with excess capacity by most industries, creates generally a good climate for stable wholesale prices."

#### 5. Total New Construction

Once again we want to emphasize that we are discussing the outlook as seen by the economists. These remarks should not be confused with the construction forecast made by F. W. Dodge Corporation itself. The Dodge forecast is made independently of these survey findings, and may or may not agree with them.

The majority of economists look for a good year in total new construction. On a seasonally adjusted annual rate basis, the median estimate of the work-in-place series rises steadily from \$57.8 billion in the second half of 1961 to \$59.8 billion in the second half of 1962. For the latter period, the 50 per cent range of forecasts runs from \$57.5 billion to \$61 billion with a fairly pronounced modal preference for \$60 billion.

Many of the respondents commented that strength in new construction would be concentrated in the publicly-owned and nonresidential building sectors. One economist thought that construction of fallout shelters "may become significant enough to increase 1962 volume by a billion or more dollars . . ."

**COMMENTS:** "Both the private and public sectors of this series will show good growth through most of 1962. Non-farm residential in the private sector may be somewhat of a laggard, but the other components—military, highway, public nonresidential, and public utility private—look very good." / "New construction will be higher in nearly every sector in 1962, but all increases will be moderate. Public construction will, of course, show the greatest rates of increase." / "Gains may be small after mid-1962 as declining housing starts are likely to partially offset increases in nonresidential con-

struction." / "Most of the gains in this sector will come from Federal highway, and state and local government spending. The current commercial office building boom seems likely to continue somewhat longer but is approaching a saturation level." / "There may be a lull in the rise—uncertainty over the Administration's position, money troubles for housing, etc.—then a resumption in the rise as adjustments are made." / "Major gains likely to be ordered in the public sector, with industrial construction helping out next year. Not much further growth in housing activity expected in the near-term." / "Construction of apartment houses and other housing will decrease in the latter half of 1962 because of overbuilding." / "Most of the stimulus here should come from the government and non-residential areas." / "Nonresidential construction should show marked improvements as a result of the business recovery. However, the continuing basic lethargy in residential housing demand is likely to neutralize most of the gains made in nonresidential construction sector of the industry." / "A good year—a record year, but no major surge. Tough competition, financial strains, and many contractor failures." / "Public expenditures, non-farm residential will register gains as confidence is restored to home building and the various governmental bodies continue their building projects expansion. Growth will also be seen in business construction activity."

## 6. New Housing Starts

Of all the major indicators, new housing starts engendered the least enthusiasm among the economists. At least for the short-term outlook, most of them could find no large stimulant to new housing construction. The new housing legislation is expected to help somewhat, but there seemed to be a general feeling that a real boom in home-building would have to wait until later in the decade when big increases in household formation are scheduled to occur.

Anyway, the seasonally adjusted annual rate of private, nonfarm starts averaged 1,206,000 during the first half of 1961. The median forecast calls for a rate of 1,300,000 during both the second half of this year and the first half of 1962, then a very slight rise to 1,325,000 during the second half of 1962. Although this would mean some increase in the year-to-year totals for housing starts, it does not indicate any gain from the current rate of new starts.

For the second half of next year, the 50 per cent range extends from 1,225,000 to 1,375,000. There is a very distinct mode of 1,350,000.

COMMENTS: "A further, modest rise in the seasonally adjusted rate of housing starts will be cut short by the spring of 1962 because of lack of demand and the rising cost of a shrinking supply of mortgage money." / "Continued gains are anticipated in housing starts. However, peak starts in 1962 will fall well below the 1959 highs. Cyclical weakness may begin to show up in the second half of 1962." / "The demand for new housing, at today's prices, does not appear to respond too well to artificial stimulation through the increased availability of mortgage funds and the lowering of downpayment requirements." / "This is dependent upon new family formations and I can't see anything dynamic here until 1964 or 1965." / "I still keep hoping that the builders will come to realize that the only limitations in recent years have been their inability or reluctance to meet realistic market requirements.

Apartments will continue to play a major role in private housing in 1962." / "Current vacancy rates will put a damper on any real housing boom in the near future." / "The dynamics of population growth will not be favoring the age groups interested in the new home market. Rather than an increase in total new housing starts, there is likely to be an up-grading of housing so that larger, more complete and more expensive homes will be in demand." / "The housing upswing was solely the result of a boom in apartment construction, as the conventional single-family home is still lagging behind the 1960 pace. The new house market is still slow and sluggish, with no signs of any basic change in 1962." / "It is doubtful whether mortgages will actually be available in large volume on the low downpayments and long repayment periods made available by the 1961 housing law." / "Housing will be stimulated by the prosperity evident in the rest of the economy. Higher incomes, favorable interest rates, and government programs will all act as incentives." / "Consumer demands, rather than credit availability or special stimulants, will determine the volume of home building." / "A reduced rate of household formation combined with the satisfaction of most urgent demands for new housing may limit the scope of a housing upturn."

## 7. New Plant and Equipment Expenditures

Most of the economists expect a rising trend in plant and equipment expenditures in 1962. The median forecast of such expenditures at seasonally adjusted annual rates advances from \$35.5 billion in the fourth quarter of this year to \$36.8 billion for the first half of 1962 to \$37.6 billion for the second half. This would put 1962 capital spending slightly above the previous record year of 1957. Actually, there were 21 economists who thought that capital spending would top \$40 billion for the second half of next year.

Because of excess capacity in many industrial lines, the major part of the growth in capital spending is expected to occur in the equipment sector.

COMMENTS: "The need for modernization in most areas of industry is apparent. A rate of about \$36 billion is estimated to be a minimum investment to avoid over-aging of the industrial facilities of the U. S. A." / "Businesses' plans for new plant and equipment expenditures that were postponed during 1961 due to lower sales and profits will be reactivated during 1962." / "Capital spending will be a major boost to economic activity in 1962. In spite of adequate capacity, business must continue to spend large sums of money for plant modernization and cost improvement programs to meet domestic and foreign competition." / "Excessive capacity will continue to put a drag on capacity increases, but a moderate rise is certain." / "Emphasis will be placed on modernization of equipment rather than new plant expenditures. Investment is being forwarded but slowly. Once the boom becomes obvious, investment will pick up speed." / "New records ahead—but heavy on equipment side. Expenditures will be to meet competition, not for capacity." / "Present plant capacity adequate in most lines, except in connection with defense production." / "Obsolescence will be big factor in plant modernization; tax incentives will also help." / "Capital spending for new plant and equipment will reach an all-time high in 1962, as manufacturers strive for increased efficiency. The preference will be for spending on equipment rather than labor wherever possible." / "Substantial overcapacity continues to be a limiting factor; however, the sharp increase in corporate cash flow (after taxes) and floatations (the bulk of which

will be used for plant and equipment) in the second quarter suggest a rise to record levels in 1962 if general business activity continues to expand." / "In spite of the over-capacity existing in many industries, the need for cost-cutting equipment, the growth of military business, and the push on new products will stimulate new plant and equipment expenditures."

## 8. Average Hourly Wages

There is nothing in the offing to halt the upward movement in average hourly wages. This is the almost universal opinion of our respondents. In fact, not a single economist thought wage rates would decline in any of the major categories: durable goods manufacturing, non-durable goods manufacturing, and building construction. A few thought there would be no change in non-durable goods manufacturing and in building construction, but these were a very small minority. Some economists felt the continuing upward trend in wage rates would moderate somewhat owing to increased foreign competition, the relatively high level of unemployment, and some "stiffening" on the part of management negotiators.

COMMENTS: "Wages will go up all around. The auto settlement provides an increase, and the same will be found in other contract negotiations." / "The direction of change in wage rates is known. The only uncertainty is the amount of increase. Labor unions continue to refuse to accept reality—an increase in supply of labor relative to demand. How long can labor squeeze the goose before she stops laying?" / "Trend expected to continue upward but at more moderate rate. There has been some real stiffening in recent months in management—union negotiations on wage matters." / "Wages will continue upwards in all sectors with the increasing business activity." / "There are too many automatic increases built into present contracts to expect any change in direction for hourly wage rates. Sympathetic Federal government policies also will serve to move wage rates to higher levels." / "Wage scales in durable goods industry are likely to follow pattern of auto industry which is about a 4% increase." / "The more than ample capacity in many industries, the relatively high level of unemployment and intensified foreign competition will dampen any chances of a substantial advance in hourly wage scales." / "Scale will tend upward, but at more moderate rate than in prior postwar recovery periods." / "Union power and government policies will continue to push up wages as they have in good times and bad." / "The evidence is in, the verdict a foregone conclusion."

## 9. Personal Consumption Expenditures

Although consumer spending has not progressed as well as expected thus far in the recovery, it is expected to show more vigor next year. According to the average anticipation of the economists, expenditures will be at a seasonally adjusted annual rate of \$340 billion during the second half of 1961. Thereafter, they will climb steadily to \$350 billion for the first half of 1962 and \$360 billion for the second half.

Nevertheless, quite a few economists commented that

the consumer may not be in a spending mood next year—at least, not in a mood to support a boom in durable goods which many economists are forecasting. Some of this qualified pessimism is reflected in the 50 per cent range of numerical forecasts which extends further downward than upward for both halves of next year. It reaches between \$340 billion and \$355 billion for the first half and between \$345 billion and \$365 billion for the second half.

COMMENTS: "Personal consumption expenditures have lagged thus far in the recovery, but should catch up in the next twelve months." / "Durable spending will be once again lending major support, which combined with those hardy perennials, spending for non-durables and services, will be the major support of the cyclical trend in 1962." / "Rising consumer spending will accelerate beginning with the fourth quarter of 1961. Consumer durables, soft goods and services, all, will share in the increase." / "Consumers are not likely to go on any wild spending sprees while inflation remains in check." / "Longer hours, higher wage rates, a larger work force, and a slightly rising price level will combine to increase consumer expenditures sharply." / "This sector will receive its increase chiefly from durables and services. Food and other non-durables will increase slightly, but their significance will be minor." / "Purchases of durables are expected to move somewhat back into the limelight, with a particularly good year for autos. Record spending for services will continue." / "Consumers don't appear to be in a mood to step up their spending, in spite of growth in personal income." / "This area is the biggest question mark of the coming 18 months. Even if the figures look good, if consumers continue to spend more for services, relatively less for heavy durable goods, the amount of 'lift' given the economy will be smaller." / "Spending for services should continue its steady uptrend. Strength in the durables sector will depend heavily upon consumer acceptance of the 1962 autos. The absence of any strength in consumer credit is disturbing." / "Higher personal incomes will mean higher personal spending, particularly on durable goods." / "If they have it, they spend it. They will have it."

## 10. Money and Interest Rates

The question on interest rates, phrased in terms of the series on prime commercial paper, four to six months, drew the only sizable non-response. Twenty-one per cent of the economists did not make numerical estimates for part or all of this question. Of those that did, the consensus was that interest rates would inch up during 1962. The median estimate of the prime rate, which stood at 2.9 in June 1961, runs from 2.9 again for this December to 3.4 for December of 1962. At the end of 1962, the 50 per cent range spreads between 2.8 and 3.7. There is a decided modal preference for 3.5.

COMMENTS: "With the rising business activity, money and interest rates will follow an upward course." / "Money will tighten as economic activity continues to expand and as business rebuilds inventories and boosts capital spending programs. President Kennedy or CEA will be unable to stop it." / "Criticism of monetary action in past recession, high and sticky unemployment of labor and capital, and lack of upward price pressures will tend to

make supply of credit ample for most uses." / "Pressure on money rates should be forthcoming late this year. If the Federal Reserve Board still has its independence, they can be expected to hike the discount rate late this year, or early next." / "After the influence of the revival is more widely felt and inflationary pressures develop, rates will have to rise." / "Short term rates will trend higher next year, but should hold below peaks of 1959-60 period." / "Because of the greater desire for easy money by the monetary authorities now than at comparable stages of earlier recoveries, I look for relatively little increase in interest rates and as a result I expect the various classes of credit-financed spending to rise relatively more and to precipitate a much sharper rise in prices and cutback

in unemployment." / "In order to encourage business to borrow bank credit the rates will be kept low." / "I assume the Federal government will keep money markets fairly easy until the unemployment rate is reduced to about 4%." / "Government borrowing may rise substantially and supply a firmer undertone for interest rates. On balance, I expect a moderate rather than a sharp advance in interest rates for the rest of 1961 and for all of 1962." / "The whole question of international balance of payments and goods movements may force higher levels next year than would be warranted on purely domestic economic money flow conditions."

EDWARD A. SPRAGUE

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## The Death and Life of the Housing Project

As America proceeds with a great program of urban rebuilding, pushed with great energy by the federal government, I should like to suggest as required reading a new book, "The Death and Life of Great American Cities," by Jane Jacobs. Mrs. Jacobs' book is a refreshing burst of sense, and it couldn't have come at a better time.

She has taken a long look at cities to see what makes them work. And she concludes that many of the most generally accepted ideas about city planning and city housing are so naive as to be simple-minded. She demolishes the simple ideas behind such concepts as the Garden City, the City Beautiful and the Radiant City, which have "harmoniously merged into a sort of Radiant Garden City Beautiful." The trouble is that cities, and the people in them, don't seem to behave like the planners thought they should. "From beginning to end, from Howard and Burnham to the latest amendment on urban-renewal law, the entire concoction is irrelevant to the workings of cities. Unstudied, unrespected, cities have served as sacrificial victims."

Her common-sense observations are quite cogent when she points out that the busiest streets are the best streets, safest for adults and children alike, policed as they are by the watchful eyes of thousands of interested busybodies. Why those streets, too, offer the most in the right kind of human contact. Why the planned spaces in the planned housing projects are scary "jungles," and why the grass plot that the planners make so much of is just a patronizing gesture to the people who live there. Why human relationships work so naturally in the crowded streets, so confusedly in the housing development.

Mrs. Jacobs believes in cities, and likes them. And she offers much comment and some advice on how they might be saved for the people in them.

This observer applauds especially her remarks on the ineptness in planning that is represented by the planned housing project. I have al-

ways considered public housing as overly regimented, dismal and unwanted, most of all by the people who live in them. Mrs. Jacobs does not distinguish between public housing and private, low-rental or middle-income; she damns them all. But I should say that public housing has the least reason for being what it is, and represents an especially dismal example of what happens when government calls the turn in design. I am sure that architects went happily along with most of the planning ideas that Mrs. Jacobs scorns, if indeed they didn't originate them. But public housing makes them more apparent, makes them bigger, more plentiful, more blatant.

While most of the architectural and building world applauds the efforts of the government to clear slums and renew the city, I think there is reason to be wary of government-directive-oriented leadership in determinations to revamp whole sections of the city. We have been doing it for years and years and years, and nobody is happy with the results.

Now we have a new burst of federal activity toward clearing slums and developing new "projects"—bigger and better projects. But as Mrs. Jacobs insists, "one of the unsuitable ideas behind projects is the very notion that they are projects, abstracted out of the ordinary city and set apart."

And soon we are to have a new federal department of urban affairs, or some such, to deal at the federal level with the problems of city planning and building. Urban renewal has already been heavily pushed and heavily financed, so that soon we shall have rebuilding projects going in small cities as well as large.

We shall need a great deal of building to house our rapidly growing population; and we shall need it in the city. Let us be sure that we are organizing a country-wide effort to plan along the right lines. If Mrs. Jacobs is right—and her book is mighty persuasive—it looks like some changes in direction are indicated.

—Emerson Goble

# BALANCING THE WORK LOAD FOR ARCHITECTURAL AND ENGINEERING DRAFTSMEN

How a simple idea—using architectural and engineering draftsmen interchangeably—saves time and produces better results in a moderate sized office

by Clinton Gamble, A. I. A.  
Gamble, Pownall & Gilroy

Like everyone else who has an architectural practice, we have had to face the problem of coordinating ever increasing engineering phases of building with architectural phases. Our work has consisted mainly of commercial buildings, where extensive lighting requirements, large air conditioning systems, and a technological rash of restaurants, bars, ice cream parlors, and miscellaneous shops spring up to complicate the architect's life. We were becoming more and more concerned about the diversity of technical requirements and their attendant difficulties, including even the production of the work itself in our office.

We were suffering from a common ailment: We weren't able to support, during architectural phases, a large enough engineering staff to finish the work when we needed it under the pressing schedules that exist during engineering phases. And if we put on extra engineers at that time, we couldn't hold them while we were making architectural preparation for the next job.

Somehow, our architectural draftsmen and project managers always seemed to be kept busy developing sketches, setting up schedules, making sections to find out what the building really would look like. But the engineering sections were not about to "waste time" doing any of these things "because it was going to be changed anyway." The engineers wanted to wait until the architectural elements were firmly determined before they went to work. The result, as you might expect, was that the engineering was always being finished in a mad scramble about four days later than the schedule.

We had about concluded that the best solution was to abandon our own engineering department and hand the whole problem over to eager young consultants who were ready to take over and produce all the engineering drawings at fees lower than our own office costs. We realized, of course, that this was not a real solu-

tion and would undoubtedly introduce new problems by the very nature of the architectural process. We rejected it.

What, then? One day we timidly suggested to our electrical designer that an architectural draftsman might be able to draw the hundreds of little circles with connecting dotted lines and numbers—if, of course, the electrical man would supervise him carefully. Reluctantly the electrical designer agreed, and sure enough the architectural draftsman did a good job. He even pointed out several beam interferences, a better panel location, and a few minor adjustments, because he had just been working on the architectural plans and knew the project intimately.

Within a few months, we managed to get our whole drafting force re-oriented. It turned out that most of the architectural draftsmen and some of the engineering men were capable of doing both architectural and engineering drafting. The effect of spreading the work was to take down the wall between the two drafting rooms. Amusingly enough, this we did in a real way. For some reason, the engineering department, over the fifteen years of its development at this location, had barricaded itself into a far corner of the general office. As a dramatic gesture, we actually took down a dividing partition to convince ourselves we had a common job to do.

Naturally, there are a few on the staff who continue in their own specialties. The air conditioning designer still does that exclusively, as do our electrical and plumbing and piping designers, our delineator, specification writer, and so on. But we no longer have engineering personnel sitting around waiting.

This arrangement has many advantages. Obviously, a man who has just worked on the structural diagrams is very conscious of the location of the air conditioning ducts. He keeps such details in mind, because he may next be laying out those ducts

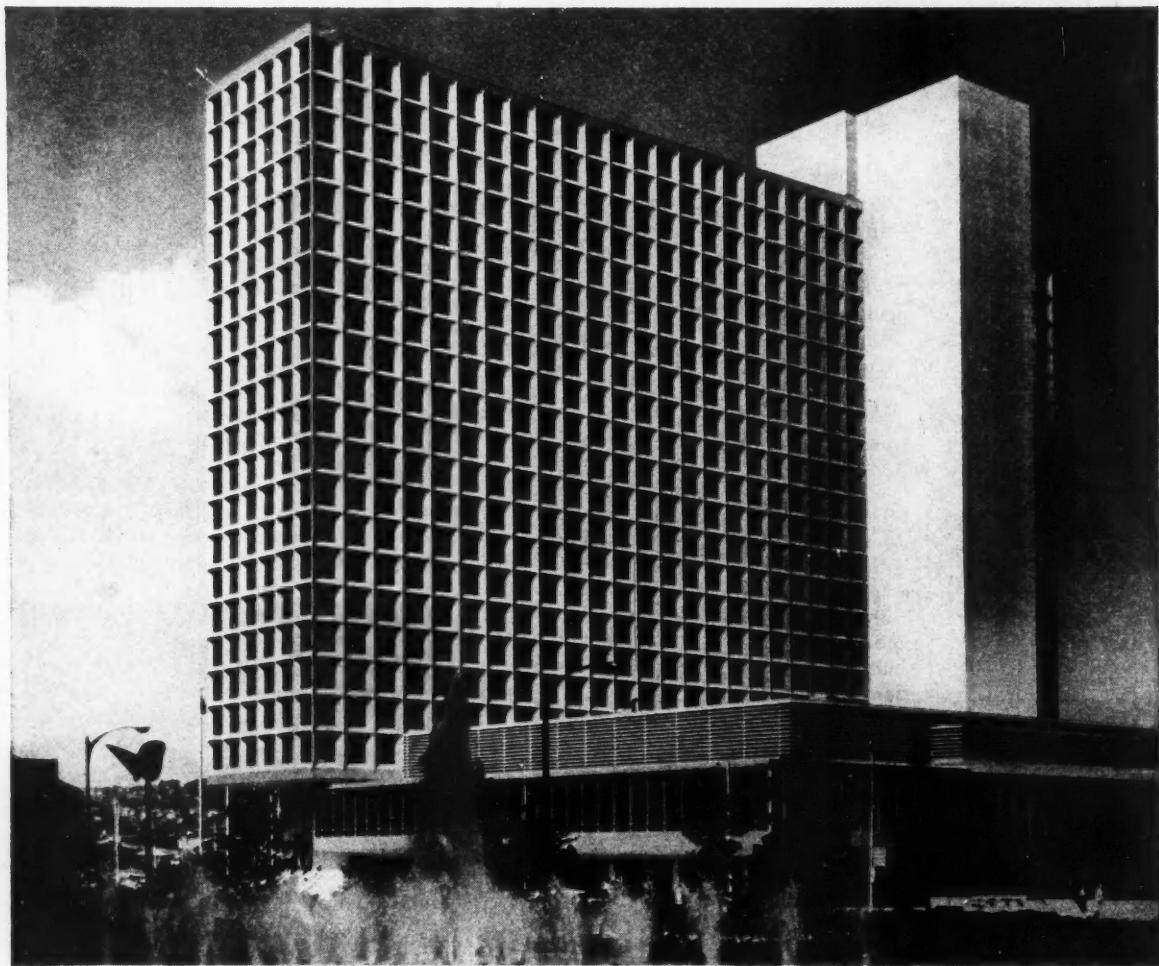
under the direction of the air conditioning designer.

And, wonder of wonders, we find the whole project finished the day the schedule calls for it. We have reason to believe our job costs are going down, too, although this has not been an objective.

I do think perhaps a smaller office may find the procedure even more useful, especially where they can persuade engineering consultants to incorporate their design into working drawings with the architect's own staff. This would be a particular advantage if the architects on the staff were the architect, himself, period.

I don't say we have solved all the problems of our professional practice. As a matter of fact, our particular solution seems so simple that I am sure dozens of architects over the country may have been using this method for years. Each office, of course, has its own traditions and personalities to cope with. There is still some kind of built-in antagonism even between engineering designers themselves. When I try to pinpoint the difficulty, I usually come back to the idea that the design of mechanical equipment is a matter of making a lot of empirical decisions which take on the aspect of personal opinions. Even catalog information sometimes seems to fall into this category; so a fierce personal defense by the designer is constantly necessary.

Actually, we have moved so rapidly into extensive mechanization of our spaces that we have borrowed a lot of engineering services from other fields. Many of these fields are not building oriented. Perhaps when mechanical designers have been at work on building problems long enough, they will feel more comfortable in the architectural office environment and not be constantly antagonized by the interference and probing of "laymen" like myself. This cannot happen overnight, but I would like to think our changeover is a small step in the right direction.



PITTSBURGH HILTON HOTEL, Pittsburgh, Pennsylvania. Architect: Wm. B. Tabler, N.Y.C.; General Contractor: Turner Construction Company, N.Y.C.; Mechanical Engineers: Jaros-Baum-Bolles, N.Y.C.; Plumbing Contractor: Sauer, Inc., Pittsburgh.

## 130,000 lbs. of water lines! Anaconda copper tube up to 8" throughout

There are many reasons why Anaconda Copper Tube is so often the choice for modern water supply and drainage systems. It is, for example, extremely easy to handle in limited work spaces. This, of course, helps keep initial costs low. Add such advantages as long life and trouble-free maintenance and you have a material mighty hard to beat.

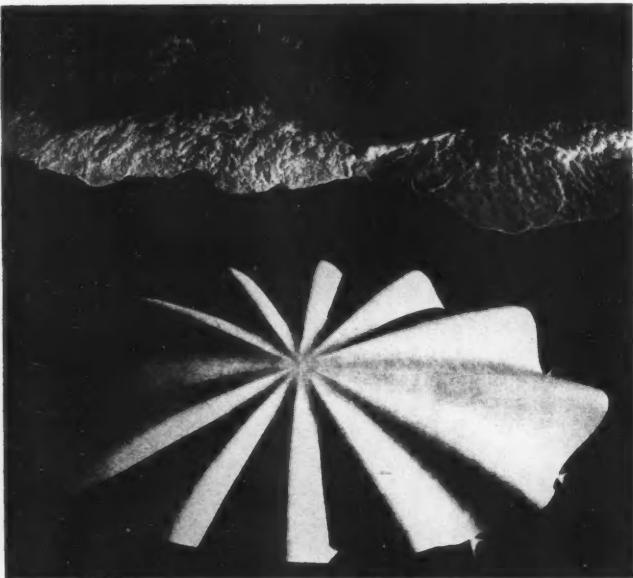
For complete information about Anaconda Copper Tube and Fittings for general plumbing, heating, air conditioning and refrigeration, write for free copy of Publication B-1, Anaconda American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

61-1027



In the new Pittsburgh Hilton the hot, cold and chilled water supply is delivered by 130,000 lbs. of Types K and L Anaconda Copper Tube in sizes to 8".

**ANACONDA**  
AMERICAN BRASS COMPANY



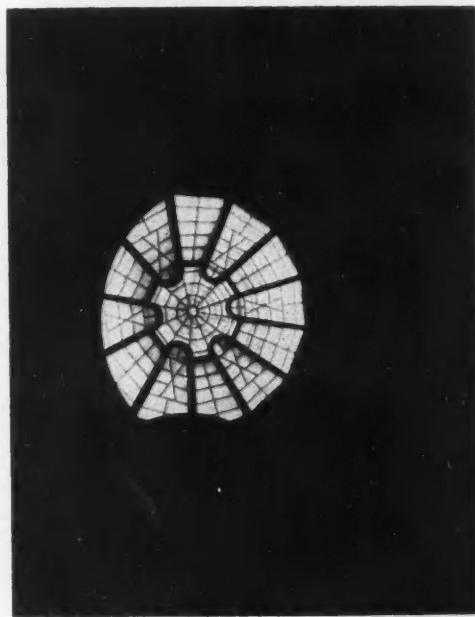
First Prize: Beach House, La Concha Hotel, Puerto Rico. Photographer: Alexandre Georges. Architects: Toro & Ferrer



Second Prize (tie): Orchard Hills Elementary School, Novi, Mich. Photographer: Mason Pawlak. Architects: Charles W. Lane & Assoc.



Second Prize (tie): Arnold Hall, U.S. Air Force Academy, Colorado Springs. Photographer: Guy Burgess. Architects: Skidmore, Owings & Merrill



Third Prize: Guggenheim Museum, New York City. Photographer: Louis Reens. Architect: Frank Lloyd Wright

## ARCHITECTURAL PHOTOGRAPHERS PICK 4 WINNERS

Four prize-winning photographs (all shown above) were selected in the Architectural Photographers Association member competition held in conjunction with this year's annual convention of the Association.

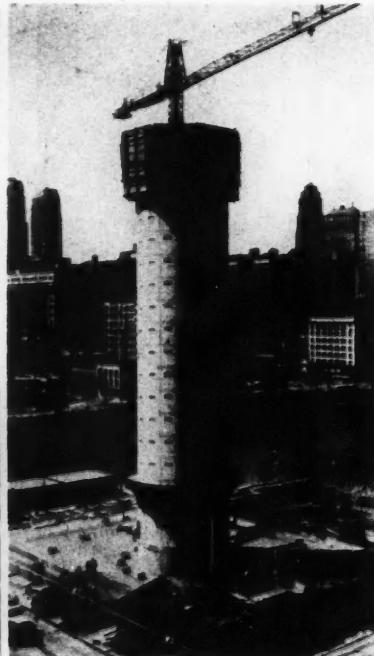
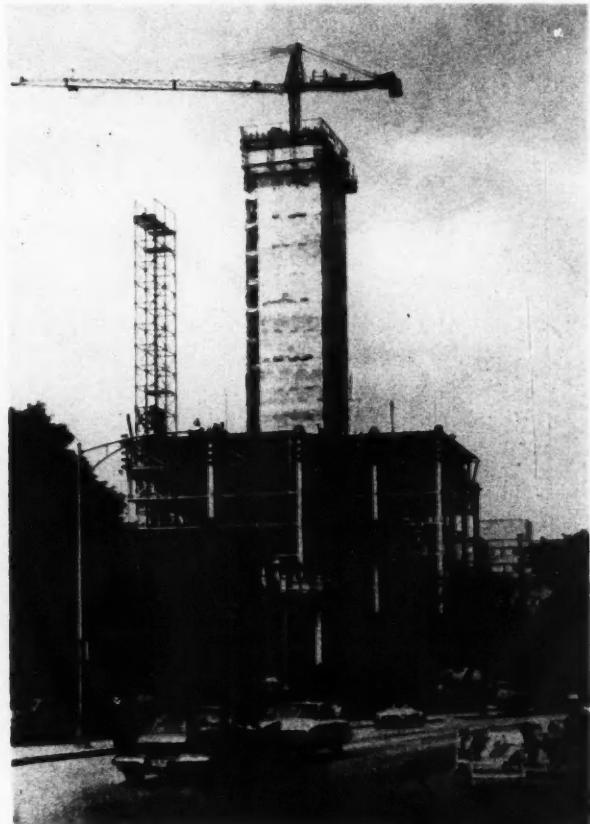
First prize was awarded Alexandre Georges, New City, N.Y. Tying for second prize were Guy Burgess, Colorado Springs, Colo., and Mason Pawlak of Lens Art Photographers, Detroit. Third prize winner was Louis Reens, New York City.

The Architectural Photographers Association is a na-

tionwide professional society of approximately 60 members comprising most of the country's leading architectural photographers. The Association's avowed purpose is "to promote and maintain the highest ethical, technical and artistic standards in the profession. A.P.A. strives to promote understanding between photographers and architects, clients, builders, advertising agencies and publishers through forums, roundtable discussions, monthly meetings, exhibitions and through exchange of technical and esthetic criteria."

## SLIP-FORM CONCRETING ERECTS 170-FT TOWER IN EIGHT DAYS

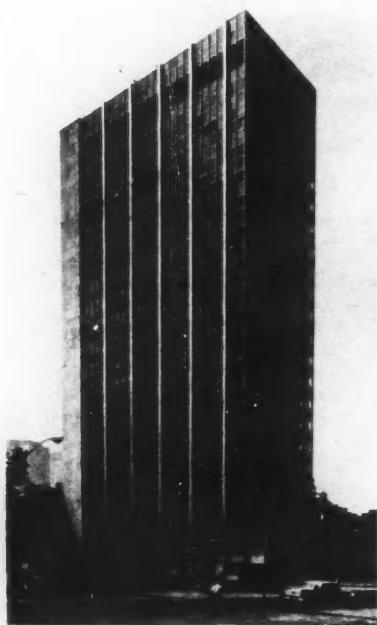
The 24- by 26-ft service core for a 17-story apartment building at 5740 Sheridan Road in Chicago was erected in less than eight days by slip-form concreting. Wooden stave slip-forms attached by a yoke arrangement to the metal reinforcement were raised by hydraulic jacks as the concrete was placed. Three crews worked around the clock, and progress averaged a foot an hour. Structural engineer is Frank N. Kornacker, through the office of Bertrand Goldberg Associates, Architects; J. Marion Gutnayer is consulting engineer; and subcontractor for this phase of the work was Mid-Continent Construction Company of Chicago.



## CHIMNEY-FORMING BUILDS TALLEST CONCRETE FRAME

One of the two circular service cores of the twin 60-story towers of the Marina City apartment project under construction in Chicago rose above the 507-ft mark last month and surpassed the tallest reinforced concrete frame building in the world (Banco do Estado, Sao Paulo—507 ft). Chimney-form concreting is the structural technique being used: concrete is being placed in stages rather than continuously as in the slip-form method, and at intervals the mast is raised by hydraulic jacks to a higher floor inside the core. The crane continues to rise with the building to its full height, is then dismantled and the parts brought down. When completed each core will rise 588 ft above the ground; diameter is 32 ft. The buildings were designed by Bertrand Goldberg Associates, Architects; general contractor, James McHugh Construction Company.

## Buildings in the News



*Wagner-International*

### Two New Towers in New York City

(Far left) Skidmore, Owings & Merrill designed the 42-story aluminum and glass home office of the Equitable Life Assurance Society. Structural engineers were Weiskopf & Pickworth; mechanical and electrical engineers: Meyer, Strong & Jones; general contractor: Turner Construction Co.

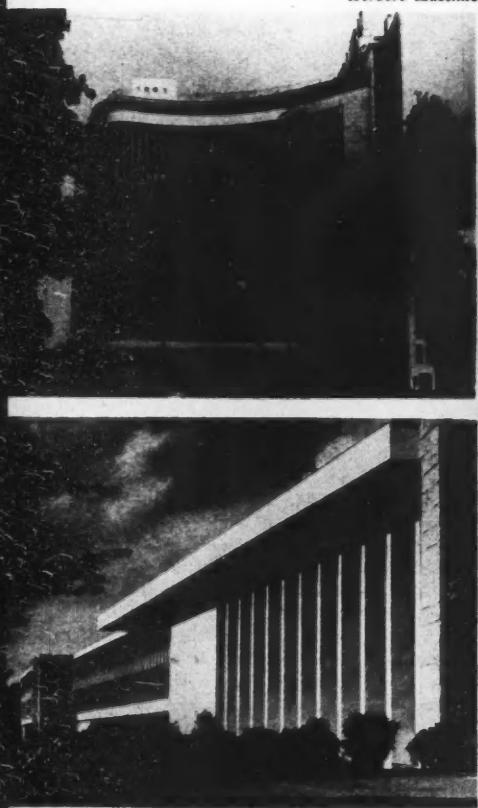
(Left) Nineteen engineering organizations now occupy the 20-story, \$12 million United Engineering Center. Architects for the tower of stainless steel, limestone and glass rising from a two-story granite base were Shreve, Lamb & Harmon. General contractor was Turner Construction Company

*Herbert Maschke*



### Architecture Abroad

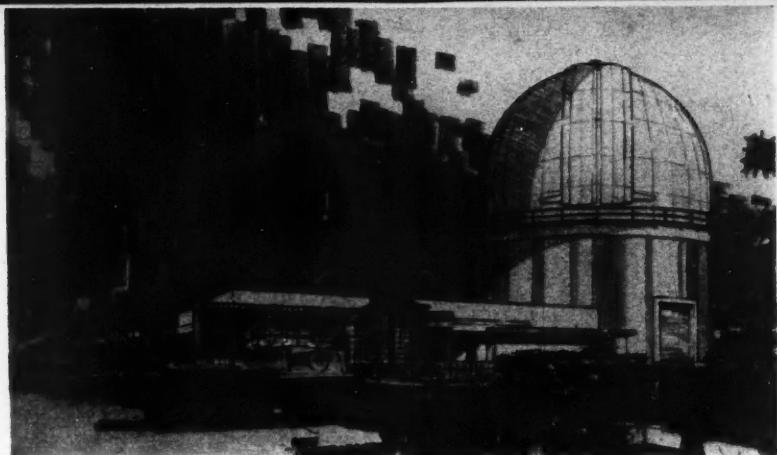
(Upper far left) R.I.B.A. Triennial Bronze Medal for Architecture was awarded the head office building of Australian overseas airline Qantas, Sydney. The 150-ft-high metal and glass structure, with a base of New South Wales green granite, was designed by architects Rudder, Littlemore and Rudder



(Lower far left) Photo of Freie University Library, Berlin, shows portion of the low element adjacent to a 9-story structure in the rear. The library, which has an exterior of reinforced concrete and Bavarian stone, was designed by Sobotka and Muller, Architects. Francis Keally, F.A.I.A., was consultant; Charles M. Mohrhardt, library consultant

New London landmark will be a 500-ft television and radio tower for the Post Office (which administers British telephone system) to transmit and receive micro-wave links. Chief architect for the Ministry of Works is Eric Bedford; structural engineer: C. G. Greetham

Construction has begun at U.S. Naval Observatory, Flagstaff Station, on a building to house the largest quartz mirror telescope ever made. The \$1,750,000 project, which includes observing instrument and 8-story-high sheltering structure, was designed by mechanical engineer, Charles W. Jones, in association with Rochlin & Baran, A.I.A.



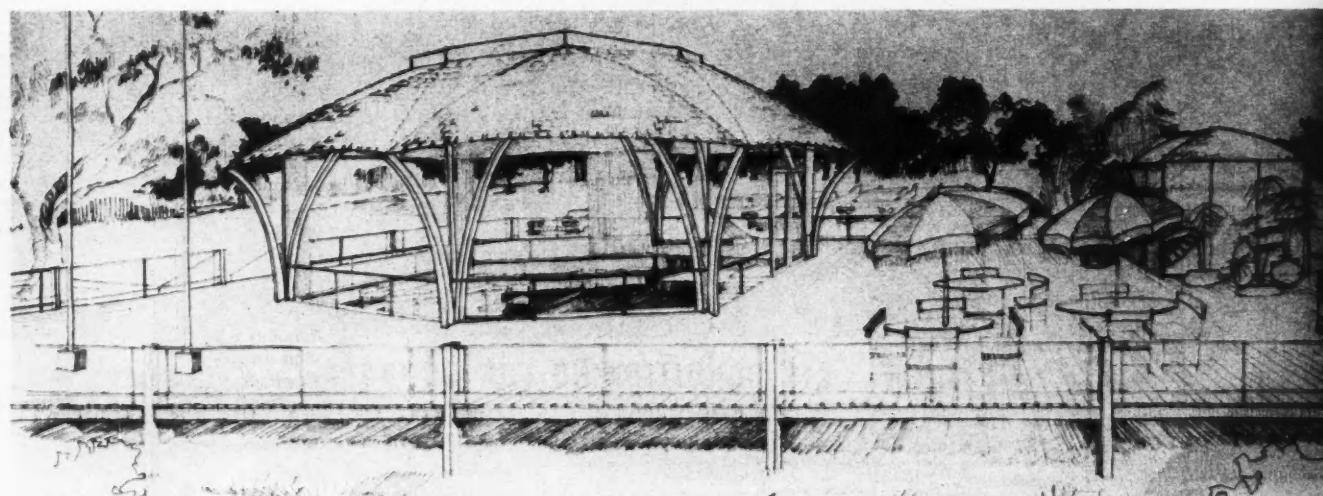
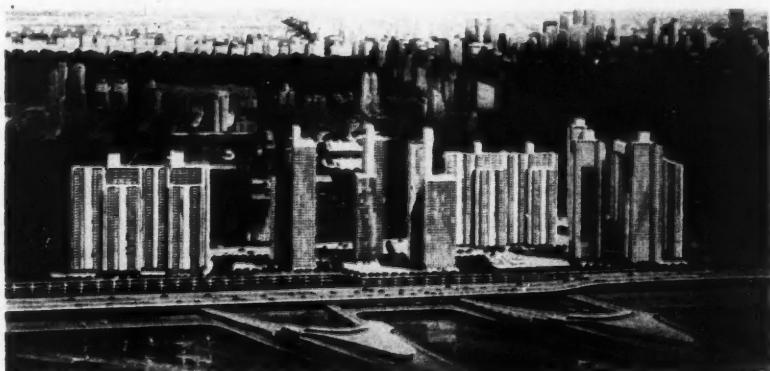
Cooper Union's \$4,750,000 Engineering Building was designed by Voorhees Walker Smith Smith and Haines. The 6-story and basement structure of steel and concrete faced with brick and stone will provide 100,000 sq ft of space for 25 laboratories, shops and drawing rooms and 22 classrooms. Contractor was Vermilya-Brown, Inc.



Ira Wright Martin

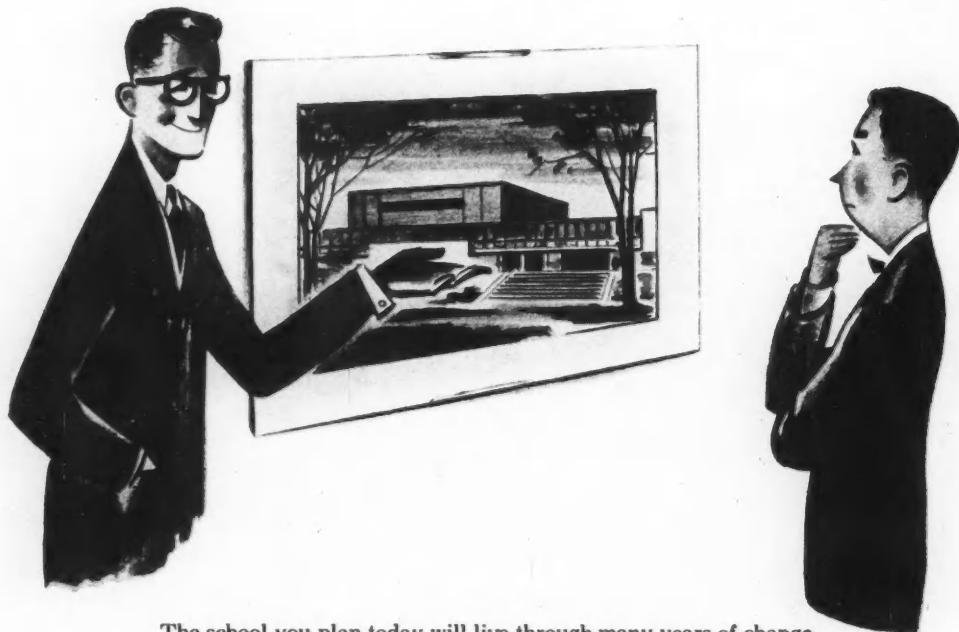
(Right) Kelly and Gruzen are architects for proposed Litho Central City, sponsored by Amalgamated Lithographers of America. The \$250,000,000 project to be located over New York Central West Side Freight Yard tracks will encompass 9 high-rise residential structures

(Below) Dallas Polo Club includes octagon reception room and separate building for players. The two structures sit on a 100- by 65-ft redwood deck. Later, two units will be joined with entry, dining area, kitchen. Architects are Bolton and Barnstone, Houston



## Will your school design stand the test of time?

Changing educational patterns demand flexible schools with learning spaces equipped for year-round air conditioning under unitary control—as an economic necessity based upon educational productivity for the life of the building.



The school you plan today will live through many years of change. How well will it *serve* in these dramatic days ahead? Education is already in revolution. Some of the demands for flexibility in schoolhouse design and facilities can be seen and dealt with now. What requirements may yet be imposed by the swift march of progress cannot, unfortunately, be wholly anticipated. But this much is sure: Maximum learning depends upon a controlled thermal environment in every space. And with the definite trend toward the greater use of a school's facilities, it is little short of planned obsolescence to build a school today without means for air conditioning as well as heating and ventilating. You can be sure your building will provide this year-round comfort with economy by giving thoughtful consideration to it in the designing stage. Nesbitt—with long experience in the school field—offers a slide film presentation, case studies, cost data, and many other services to help you and your clients appraise the importance of air conditioning for your next school.

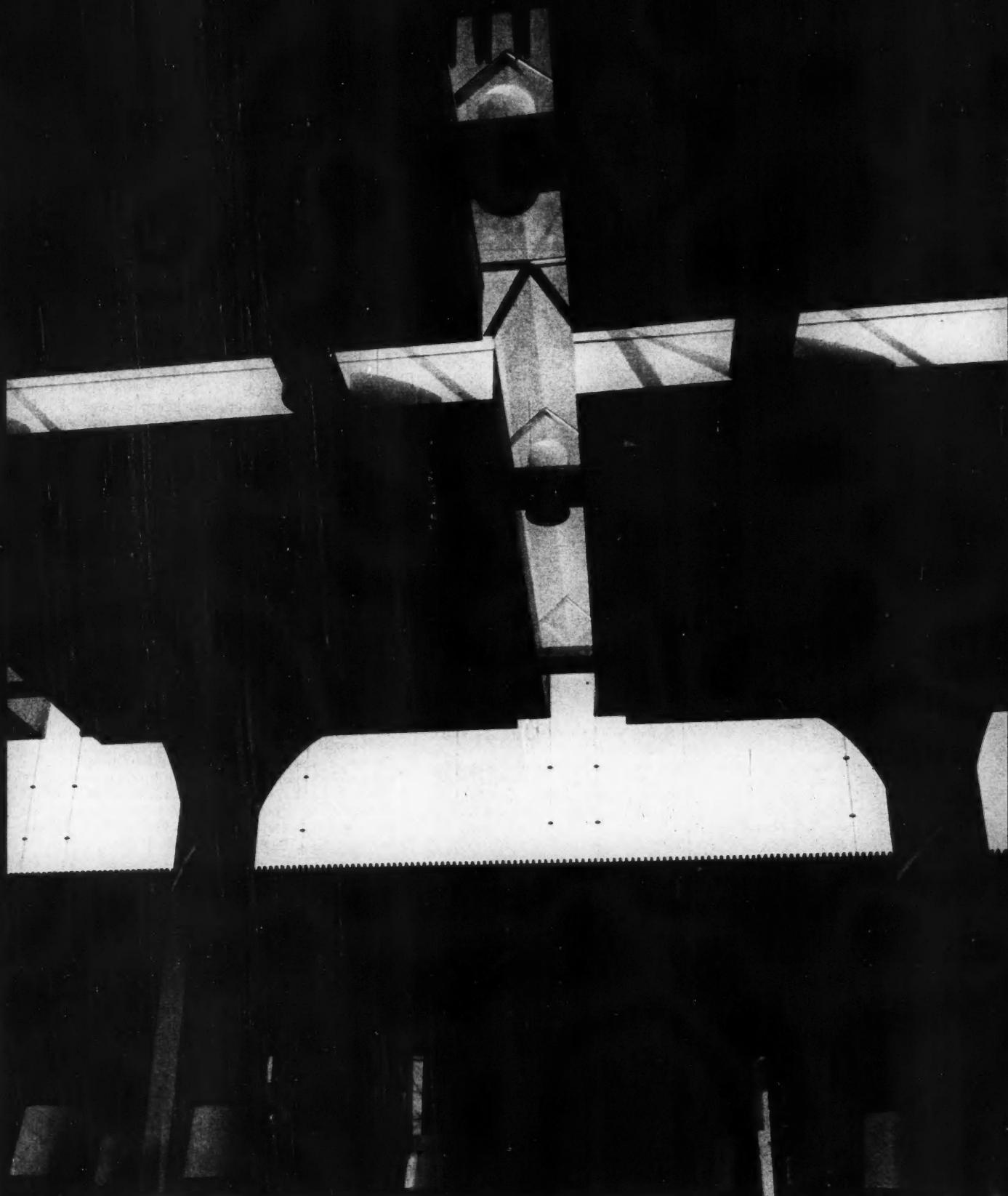
MORE LEARNING PER SCHOOL DOLLAR

**Nesbitt** AIR CONDITIONING FOR SCHOOLS



Year-Round Unit Ventilator and Storage Cabinets • Made and sold by John J. Nesbitt, Inc., Philadelphia 36, Pa.





Architect: Shepley Bulfinch Richardson & Abbott, Boston, Mass.

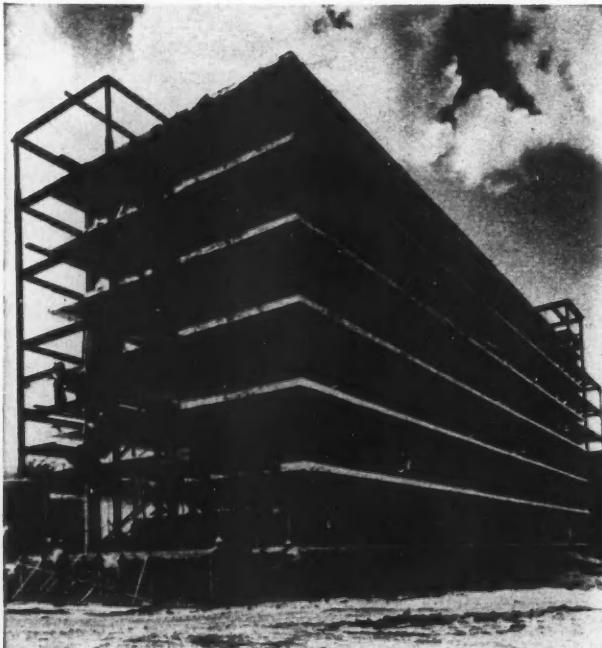
#### LEVERETT HOUSE LIBRARY, HARVARD UNIVERSITY

Each pillar-supported roof section is surrounded by ribbons of daylight — evenly diffused, glare-free. This achieves airy openness above, naturally illuminated privacy below. Execution of this concept was made possible with Wasco custom-designed continuous triangular Skydomes — molded of acrylic, the shatterproof, weathering plastic. Wasco welcomes other opportunities to combine daylighting with advanced architectural ideas. Write Custom Engineering Department.



for architects, engineers and contractors...

# New Ryerson service on



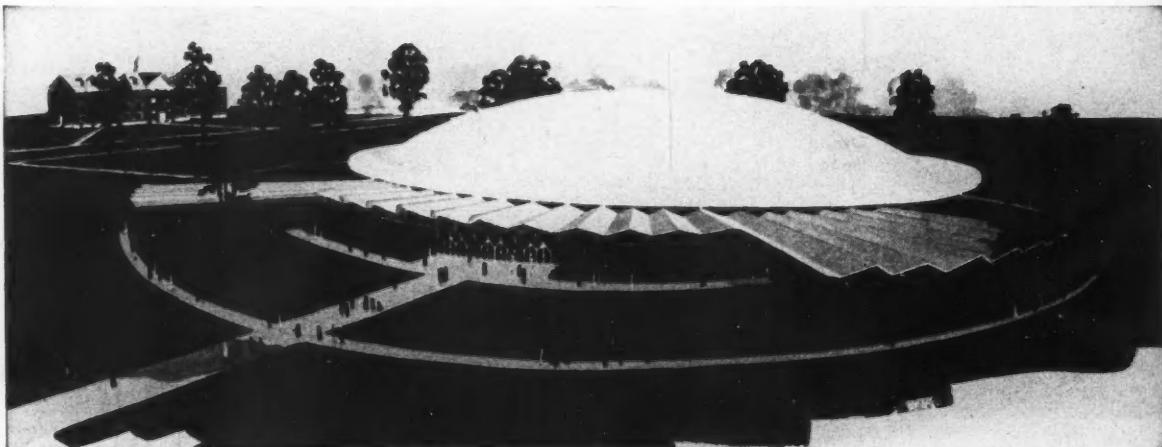
**Dormitory, Michigan State University**—28 slabs measuring 44' x 144' were poured and lifted into place in just 56 working days. Architect: Lewis J. Sarvis, Battle Creek. General contractor: Christman Co., Lansing. Lifting contractor: Great Lakes Lift-Slab, Chicago.

## WHAT THE SERVICE INCLUDES

Now Ryerson offers a unique service (initially covering the Midwest) on planning and building of lift-slab structures. This service includes:

1. Cost data to help you compare the speed, economy and modern efficiency of lift-slab jobs versus alternate methods.
2. Technical manuals on every aspect of lift-slab construction—from planning to detailing and specifying. These manuals, recently revised and expanded by a panel of nationally recognized engineering authorities, provide invaluable reference material for architects, engineers and contractors. No other compilation of data is as complete and up-to-the-minute. Here is a working guide that greatly simplifies the designing and engineering of lift-slab structures. Subjects covered include collars, columns, post-tensioned flat slabs, field procedures, equipment, specifications, etc.
3. Consultation service by a staff of Ryerson specialists with architectural and engineering backgrounds—men experienced in lift-slab and post-tensioned construction.
4. For the contractor, Ryerson can arrange for lifting services using the Youtz-Slick method, and provide a complete package of reinforcing and construction steels—including fabricated re-bars, post-tensioning assemblies, columns, collars, miscellaneous iron, etc.

On these pages are examples of a few current building projects employing the Youtz-Slick method of lift-slab construction. On *your* next job, we will welcome an opportunity to get down to specifics with you. Meantime, if we can furnish helpful information, we will be glad to do so.



**300-ft. concrete dome** (reported to be the largest of its type anywhere) is the dominant feature of this new auditorium in Anderson, Ind., for the General Ministerial Assembly of the Church of God. Dome was cast at ground level, contoured over a mound of earth. It was then post-tensioned with twelve 40-wire assemblies supplied by Ryerson—and finally lifted into place by the Youtz-Slick method. Dimensions: 250 ft. clear span, with 25-ft. cantilevers for a total span of 300 ft.; vertex of dome 68 ft. above floor level. Architect: Johnson, Ritchhart & Associates, Anderson. General contractor: Lewis Construction Co., Anderson. Lifting: Great Lakes Lift-Slab, Chicago; Sky Hook Lift-Slab, Overland Park, Kans.

# lift-slab construction

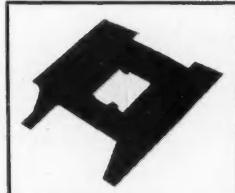
## THE LIFT-SLAB TECHNIQUE

You can do better work for less money, down on the ground than you can in the air.

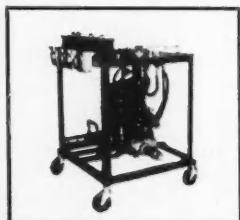
Adhering to this principle, the lift-slab method of construction enables you to pour all the slabs for a multistory building at ground level—one on top of another, separated only by a sprayed-on coating of plastic. The finished slabs are then lifted to the various floor levels by means of hydraulic jacks mounted on top of the building columns and connected to the slabs by alloy steel rods.

The lifting proceeds at a rate of about six feet an hour, and when the slabs are in place steel collars serving as shear heads transmit loads to the columns.

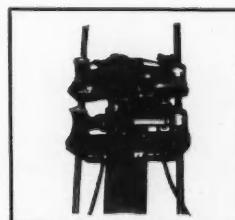
This method of construction is often the fastest and most economical for apartment buildings, dormitories, office buildings and parking structures. The present practical limit for the height of lift-slab buildings is about 20 stories. There is, however, no limit to the size of floors.



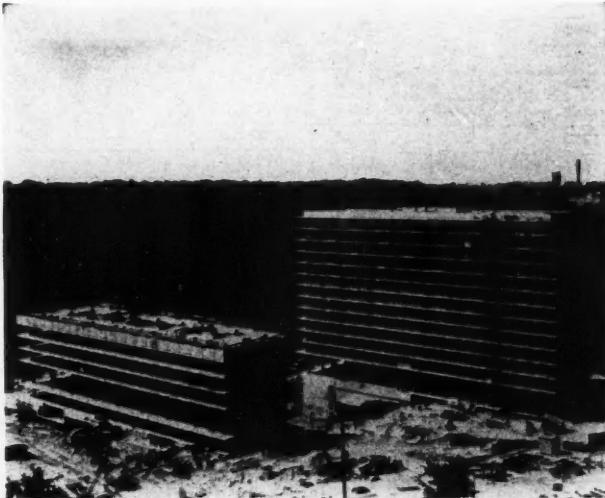
Typical Collar furnished by Ryerson for lift-slab projects. See Ryerson collar handbook for details.



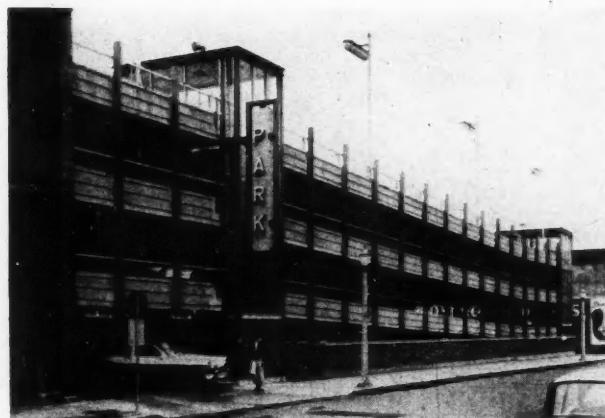
Central Console for controlling the hydraulic jacks mounted on columns, and for programming a slab lift.



Hydraulic Lifting Jack developed by REDCO of Overland Park, Kans., for the Youtz-Slick lifting method.



**Huron Tower Apartments, at Ann Arbor, Mich.** Twin 15-story apartment buildings. Owner: Huron Towers, Inc., Detroit. Contractor: Long Construction Co., Kansas City, Mo. Architect: King & Lewis, Detroit, Structural engineers: R. H. McClurg Associates, Inc., Detroit; Bob Campbell, Kansas City, Mo. Lifting contractor: Skyhook Lift-Slab Corp., Overland Park, Kans.



**Parking structure in Oshkosh, Wis.**, is the first of its kind in the Midwest to be built with lift-slab construction. Owner: City of Oshkosh. General contractor: William Warner Construction Co., Oshkosh. Architectural and engineering work: A joint venture by Sandstedt-Knoop-Yarbro, architects, Oshkosh—and Charles Nagel and Associates, Inc. architects and engineers, Milwaukee. Lifting Contractor: Great Lakes Lift-Slab, Chicago.

## POST-TENSIONING AND LIFT-SLAB

### NATURAL PARTNERS

Slabs can be made lighter, stronger and virtually deflection-free by the post-tensioning method of prestressing concrete. Thus the lift-slab method and post-tensioning become natural partners providing safer, stronger buildings at lower cost.

**RYERSON**  
JOSEPH T. RYERSON & SON, INC., MEMBER OF THE  INLAND STEEL FAMILY

I Re-Bars and Accessories • Post-Tensioning • Lift-Slab Service • Spirals • Wire Mesh • Open-Web Joists • Sheet Steel Piling • Structural Shapes and Tubing • Inland 4-Way® Safety Plate • Stainless Steel • Aluminum Building Products • PVC Water Stops • Expanded Metal • Grating, etc.

# Construction Cost Indexes

Presented by Clyde Shute, Director of Statistical Policy, Construction News Div., F. W. Dodge Corp., from data compiled by E. H. Boeckh & Assoc. Inc.

Labor and Materials: U.S. average 1926-1929=100

## NEW YORK

PERIOD	RESIDENTIAL		APTS., HOTELS, OFFICE BLDGS.		COMMERCIAL AND FACTORY BLDGS.		RESIDENTIAL		APTS., HOTELS, OFFICE BLDGS.		COMMERCIAL AND FACTORY BLDGS.	
	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel	Brick	Frame	Brick and Concrete	Brick and Steel	Brick and Concrete	Brick and Steel	
1930	127.0	126.7	124.1	128.0	123.6	82.1	80.9	84.5	86.1	83.6	86.1	
1935	93.8	91.3	104.7	108.5	105.5	72.3	67.9	84.0	87.1	85.1	87.1	
1939	123.5	122.4	130.7	133.4	130.1	86.3	83.1	95.1	97.4	94.7	97.4	
1949	243.7	240.8	242.8	246.6	240.0	189.3	189.9	180.6	180.8	177.5	180.8	
1950	256.2	254.5	249.5	251.5	248.0	194.3	196.2	185.4	183.7	185.0	183.7	
1951	273.2	271.3	263.7	274.9	271.8	212.8	214.6	204.2	202.8	205.0	202.8	
1952	278.2	274.8	271.9	265.2	262.2	218.8	221.0	212.8	210.1	214.3	210.1	
1953	281.3	277.2	281.0	286.0	282.0	223.0	224.6	221.3	221.8	223.0	221.8	
1954	285.0	278.2	293.0	300.6	295.4	219.6	219.1	233.5	225.2	225.4	225.2	
1955	293.1	286.0	300.0	308.3	302.4	225.3	225.1	229.0	231.5	231.8	231.5	
1956	310.8	302.2	320.1	328.6	324.5	237.2	235.7	241.7	244.4	246.4	244.4	
1957	318.5	308.3	333.1	345.2	339.8	241.2	239.0	248.7	252.1	254.7	252.1	
1958	328.0	315.1	348.6	365.4	357.3	243.9	239.8	255.7	261.9	262.0	261.9	
1959	342.7	329.0	367.7	386.8	374.1	252.2	247.7	266.1	272.7	273.1	272.7	
1960	351.6	337.2	377.7	395.8	380.6	259.2	253.3	274.7	282.5	278.8	282.5	
June 1961	365.5	345.5	402.6	427.3	400.7	254.8	247.3	275.0	284.0	274.5	284.0	
July 1961	367.3	346.6	405.4	431.3	403.9	254.8	247.3	275.0	284.0	274.5	284.0	
August 1961	365.9	344.8	405.1	431.1	403.5	254.8	247.3	275.0	284.0	274.5	284.0	
			% increase over 1939					% increase over 1939				
August 1961	196.3	181.7	209.9	223.2	210.1	195.2	197.6	189.2	191.6	189.9	191.6	

## ST. LOUIS

1930	108.9	108.3	112.4	115.3	111.3	90.8	86.8	100.6	104.9	100.4	104.9
1935	95.1	90.1	104.1	108.3	105.4	89.5	84.5	96.4	103.7	99.7	103.7
1939	110.2	107.0	118.7	119.8	119.0	105.6	99.3	117.4	121.9	116.5	121.9
1949	221.4	220.7	212.8	215.7	213.6	213.0	207.1	214.0	219.8	216.1	219.8
1950	232.8	230.7	221.9	225.3	222.8	227.0	223.1	222.4	224.5	222.6	224.5
1951	252.0	248.3	238.5	240.9	239.0	245.2	240.4	239.6	243.1	243.1	243.1
1952	259.1	253.2	249.7	255.0	249.6	250.2	245.0	245.6	248.7	249.6	248.7
1953	263.4	256.4	259.0	267.0	259.2	255.2	257.2	256.6	261.0	259.7	261.0
1954	266.6	260.2	263.7	273.3	266.2	257.4	249.2	264.1	272.5	267.2	272.5
1955	273.3	266.5	272.2	281.3	276.5	268.0	259.0	275.0	284.4	279.6	284.4
1956	288.7	280.3	287.9	299.2	293.3	279.0	270.0	288.9	298.6	295.8	298.6
1957	292.0	283.4	295.2	307.1	302.9	286.3	274.4	302.9	315.2	310.7	315.2
1958	297.0	278.9	304.9	318.4	313.8	289.8	274.9	311.5	326.7	320.8	326.7
1959	305.4	296.4	315.0	329.8	323.9	299.2	284.4	322.7	338.1	330.1	338.1
1960	311.4	301.0	322.2	337.2	329.2	305.5	288.9	335.3	352.2	342.3	352.2
June 1961	316.7	303.5	329.9	348.2	332.7	310.8	292.4	346.9	364.8	352.1	364.8
July 1961	317.0	303.8	330.2	348.2	332.7	311.8	293.8	347.4	364.6	351.2	364.6
August 1961	316.3	302.9	330.1	348.1	332.5	311.6	293.5	349.0	365.3	353.4	365.3
			% increase over 1939					% increase over 1939			
August 1961	187.0	183.1	178.1	190.6	179.4	195.1	195.6	197.3	199.7	203.3	199.7

Cost comparisons, as percentage differences, for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.:

index for city A = 110  
index for city B = 95

(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

$$\frac{110-95}{95} = 0.158$$

Conversely: costs in B are approximately 14 per cent lower than in A.

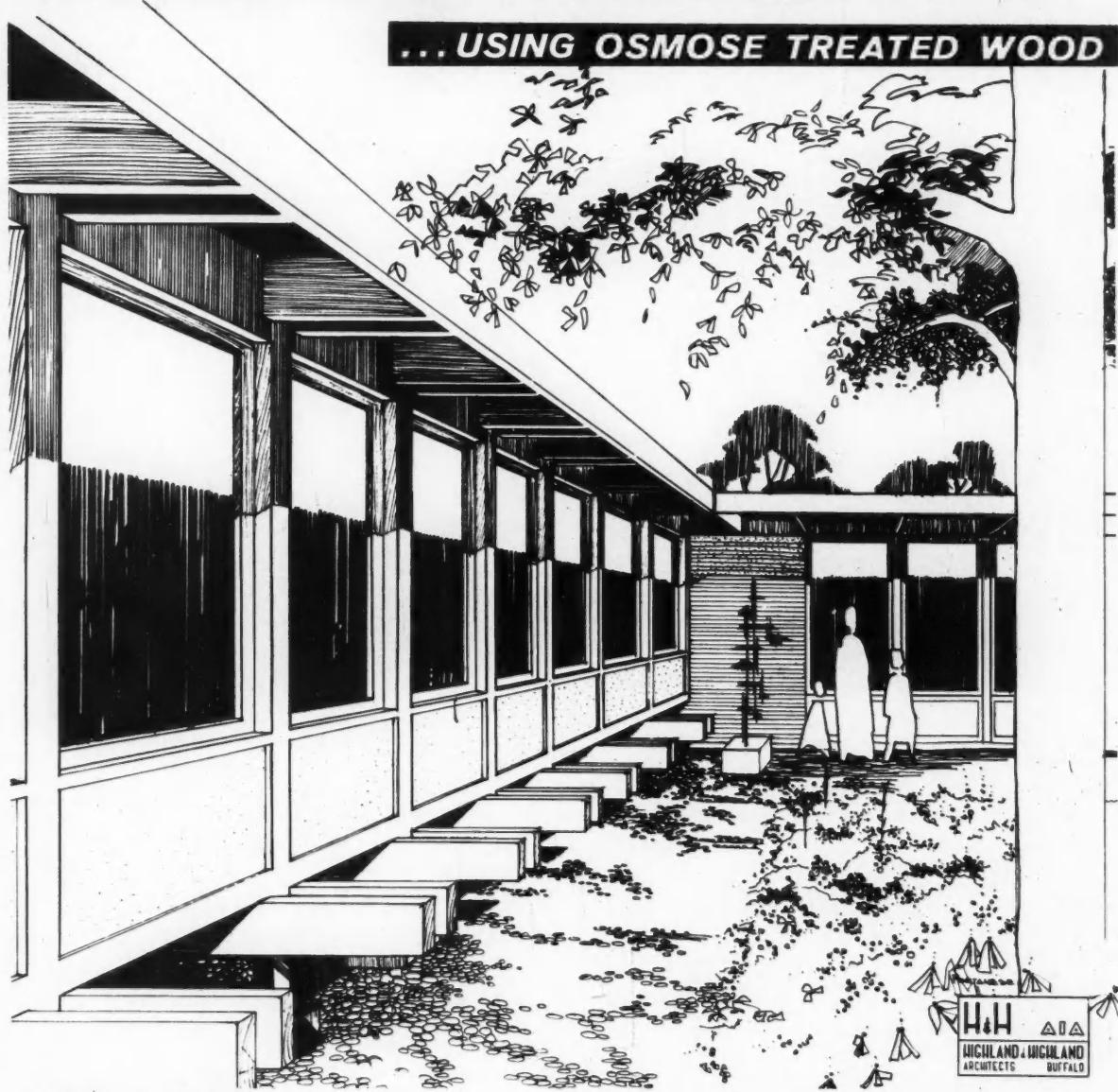
$$\frac{110-95}{110} = 0.136$$

Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926-29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published list prices, thus indexes reflect minimum costs and not necessarily actual costs.

# DESIGN INSPIRATIONS No. 2

... USING OSMOSE TREATED WOOD



## The LINK

Building out... instead of up,—is a trend that offers many structural, functional and economic advantages. That's why the so-called "Link" design, using wood, is ideal for such buildings as apartment-type units, decentralized church educational units, certain types of country residences, schools with flexibility of adjustment to changing programs and expansion, and many more. These low-slung, ground-hugging passageways often include concrete slab-on-ground floors with framing and siding down to within a few inches of the ground... prime targets for decay and termite attack. If unprotected, damage can be extensive in just a few years, repairs costly. However, the simple, inexpensive precaution of specifying Osmose Pressure Treated Lumber is all that is needed to offer long-lasting insurance to safeguard your customer's investment.

**FILL OUT COUPON** for more data on OSMOSE Pressure Treated Wood and name of nearest OSMOSE treating plant.

OSMOSE WOOD PRESERVING CO. OF AMERICA, INC.  
980 ELLICOTT ST., BUFFALO 9, N.Y.

- Send more data on OSMOSE Pressure Treated Wood  
 Name of nearest plant

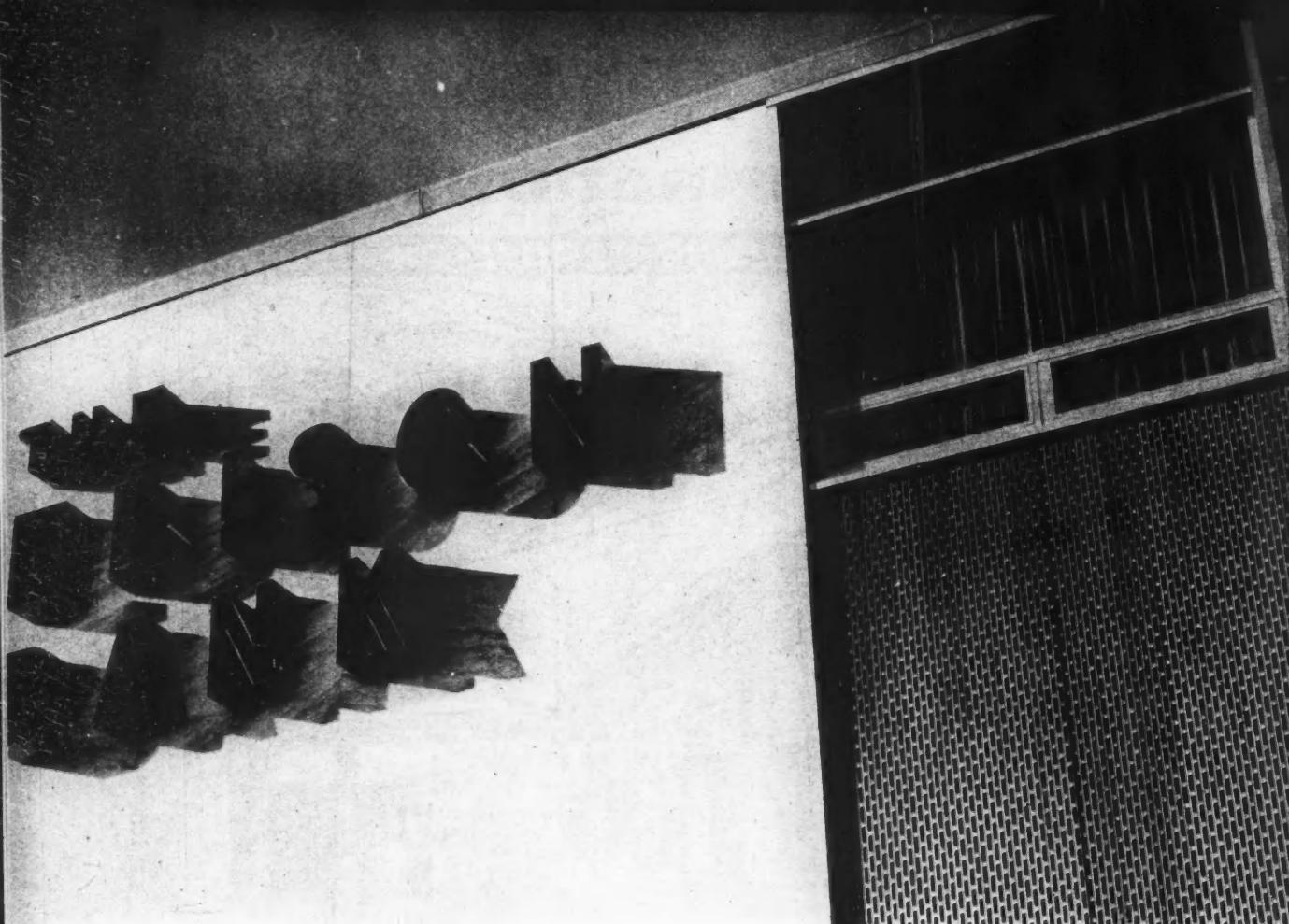
Name \_\_\_\_\_

Firm \_\_\_\_\_

Street \_\_\_\_\_

City. \_\_\_\_\_ Zone. \_\_\_\_\_ State. \_\_\_\_\_

**OSMOSE TREATED WOOD IS ATTRACTIVE • VERSATILE • DURABLE • SAFE • ECONOMICAL**



## BORDEN ARCHITECTURAL DECOR PANELS

Now Borden brings a new building component to the architect—durable light-weight aluminum panels which can be custom-styled in an infinite variety of forms and designs. For example, the extruded type shown here can be had with design punchings of squares, circles, ovals or combinations of curves and straight lines.

The new Architectural Decor Panels by Borden are an extremely flexible medium, allowing the architect a rare freedom of expression in designing facades to blend with the nature of the building, its setting, and the preferences of his client. The dramatic effects achieved with

this new material are being discovered daily; additionally, these panels are unexcelled for sturdiness, economy, ease of handling and installation, and ventilation.

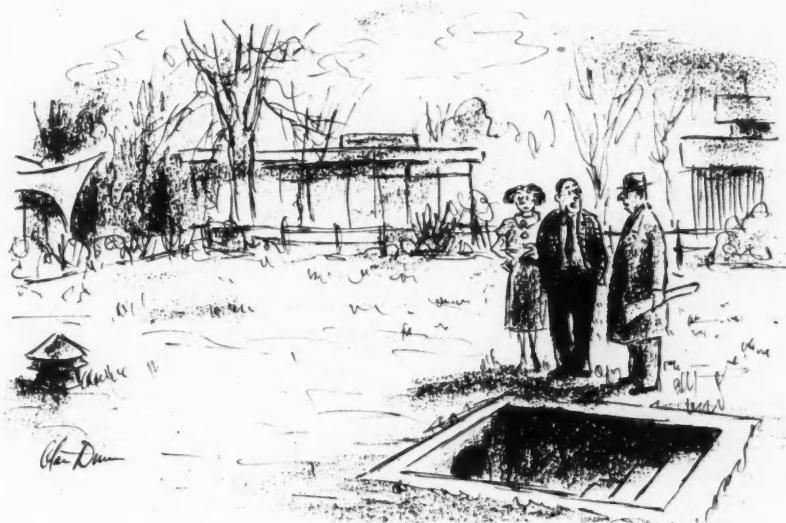
Not limited to facades, the Borden Architectural Decor Panels are used as interior partitions, grilles, window guards, stair rails, doors, entryways, sunshades, and are especially adaptable in the refacing of existing buildings.

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—Drawn for the RECORD by Alan Dunn

"But it doesn't 'communicate'!"

### Boston City Hall Competition Announced

A major competition to select the architect for Boston's new City Hall has been announced by Mayor John F. Collins and the Government Center Commission. The building will be the most important one in the Government Center, a project of the Boston Redevelopment Authority to revitalize the oldest part of the city.

The competition, open to all licensed architects who are residents of the United States, will be conducted in two stages. Professional adviser will be Lawrence B. Anderson, professor in the Department of Architecture, Massachusetts Institute of Technology. The Jury for the preliminary stage consists of: Pietro Belluschi, F.A.I.A., Boston; Harold D. Hodgkinson, Chairman of the Board, Wm. Filene's Sons, Boston; Walter A. Netsch, A.I.A., Chicago; Ralph Rapson, A.I.A., Minneapolis; William W. Wurster, F.A.I.A., San Francisco. The Jury for the final stage consists of the above five members and O. Kelley Anderson, President, New England Mutual Life Insurance Company, Boston, and Sidney R. Rabb, Chairman of the Board, Stop and Shop, Boston.

By discussion and majority vote not more than eight entries will be selected in the preliminary stage and paid \$5000 each to prepare final entries. The author of the winning

entry shall receive the additional sum of \$5000.

Registration forms must be received by the professional adviser on or before Dec. 11. Preliminary entries must be sent or delivered before 5:00 P.M. on Jan. 17. Preliminary judgement begins Jan. 23.

For further information, write: Professional Adviser, c/o Government Center Commission, 1 Court St., Boston 8, Mass.

### BRI To Become Independent Technical Society

The Building Research Institute, a unit of the Division of Engineering and Industrial Research of the National Academy of Sciences-National Research Council, will assume the status of an independent, nonprofit technical society of building science during the coming year.

The change of status, according to Leon Chatelain Jr., F.A.I.A., BRI president, has been contemplated ever since BRI came into being ten years ago. Mr. Chatelain said, it will ". . . make no changes in the organization except to enable BRI to further broaden its activities in the stimulation of needed new building research, to administer cooperatively sponsored research projects, and to accept grants for the execution of valuable projects consistent with its purposes."

### Franklin Institute's Brown Medal Awarded Corbu

The Frank P. Brown Medal of the Franklin Institute, Philadelphia was awarded in absentia to Le Corbusier in October.

He received the medal "for a lifetime of creative leadership in the teaching and the practice of architecture as exemplified by his modular concept of human scale, free plan, pillar foundations, glass walls, sun breaks and roof terraces; his city planning as exemplified by the vertical city concept and for his outstanding contributions as a sculptor and painter."

The award was set up by the will of Franklin P. Brown, a member of the 137-year-old scientific organization, for "discoveries and inventions involving meritorious improvements in the building and allied industries."

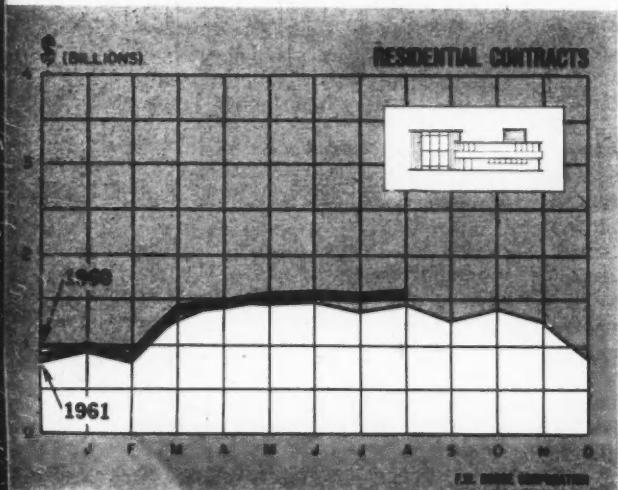
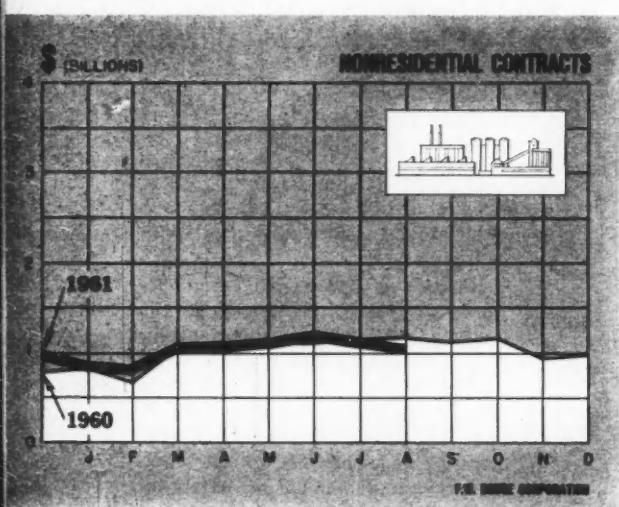
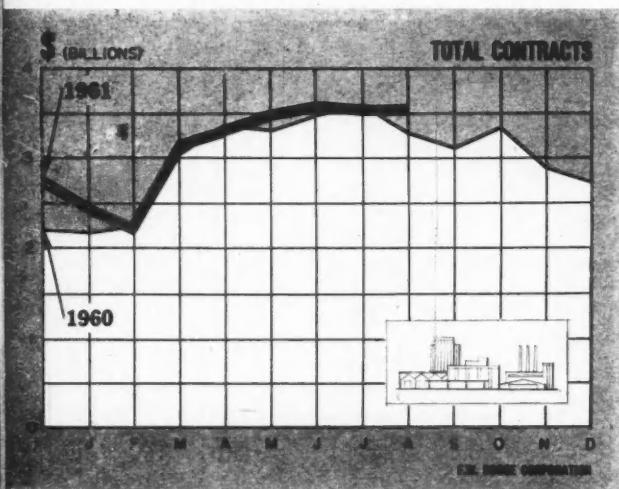
### Planners Institute To Meet in Detroit

"Goals for Urban America" is the theme for the 1961 National Conference of the American Institute of Planners to be held in Detroit during the week of November 26-30.

Mrs. Catherine Bauer Wurster, specialist in housing and urban problems, is the scheduled keynote speaker.

*continued on page 26*

## Current Trends in Construction



### INDUSTRIAL BUILDING ACTIVITY EXPECTED TO INCREASE IN 1962

THE INDUSTRIAL BUILDING outlook is a tough nut to crack. The volume of contract awards in this important category is still subject to violent fluctuations despite the more moderate swings of the typical postwar business cycle. For instance, in 1958 when the economy was undergoing a troublesome but hardly disasterous recession, manufacturing building contracts plunged a distressing 35 per cent below their 1957 level. During the upturn in general business in 1959, factory awards bounced back with a 34 per cent increase. Again, the very mild setback in the overall economy of 1960-61, now a shadow of the recent past, helped produce a 16 per cent decline in industrial building contracts during the first eight months of this year. As a result, manufacturing building awards have taken as much as 26 per cent of the nonresidential building market in 1956 and as little as 13 per cent in 1958.

SUCH GYRATIONS are not surprising considering the crucial role of business expectations in making capital investment commitments. If the general outlook is a little cloudy, businessmen still tend to clamp a tight lid on plant expansion. When things clear up a bit, fears for the worst are exchanged for rosy optimism, and capital spending is apt to go off on another binge. But although the direction of a change in plant building trends is fairly predictable, the extent of the change is not.

CURRENT BUSINESS prospects definitely appear to support a revival in manufacturing building. As indicated in our annual forecast of construction contracts (opposite page 8 of this issue), we estimate a 10 per cent gain in floor area of industrial construction during 1962. The increase in dollar volume of contracts should range a little higher—about 11 per cent. This would put the level of contract activity at approximately \$2.02 billion for the year as a whole. You may note that manufacturing buildings next year are expected to score both the sharpest percentage gain and the largest absolute increase of any nonresidential building type. However, if our forecast is borne out, 1962 contracts will still be below the 1960 mark and considerably below the peak year of 1956 when total dollar volume amounted to \$2.88 billion.

A SUPERBOOM in plant expansion is not anticipated for the immediate future mainly because of excess capacity in many industrial lines. Much of the emphasis in the quite optimistic capital spending plans for 1962 seems to be on the equipment sector rather than on new plant. This picture could change very rapidly, however, if the overall economy significantly exceeds its projected advance. In such case, manufacturing building contracts could easily soar to new heights. In any event, the long-run prospect is very bright.

EDWARD A. SPRAGUE, Economist  
F. W. Dodge Corporation  
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## WHO LOOKS AT THE ROOF?



The Solomon R. Guggenheim Museum is one of the most interesting architectural innovations in years. Art lovers often look up to admire the *ceiling* of this building . . . but no one looks at the *roof*—or *has* to! It's a special Ruberoid roof, expertly built-up with Ruberoid special roofing bitumen.

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Architect: Frank Lloyd Wright

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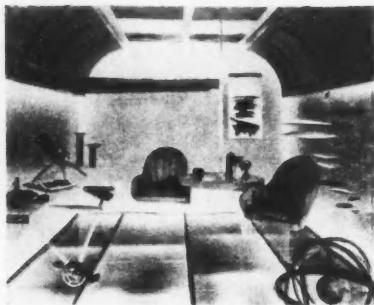
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## Meetings and Miscellany

continued from page 23

### "Astrotel": A Room With a View of the Future



This is a space transition room, situated at a Space Port; its purpose is to prepare the astronaut for the new environment of interplanetary travel by affording him a place to experience a quiet period before the flight in which he can adjust to conditions such as sounds, sights and weightlessness. The room was a presentation of the Upholstery Leather Group at the Decoration and Design Show, sponsored by the American Institute of Interior Designers and the Resources Council of the A.I.D., held in mid-October in New York.

Designed by Evelyn Jablow, A.I.D., the room is constructed entirely of glass and contains "floating" furniture, storage ceiling and cabinets covered in leather.

Since outer space is black, Mrs. Jablow has derived her "earth" color scheme from colored photographs taken from outer space and from reports by Commander Alan Shepard—blue, green, orange, yellow.

Says Mrs. Jablow, "The role of the interior designer in tomorrow's world will be as it is today—to accommodate and acclimatize people to changing needs of life with grace and art."

### \$25,000 Reynolds Award Nominations Invited

Nominations are now being received and will be through Dec. 18, 1961 for the 1962 annual \$25,000 R.S. Reynolds Memorial Award, the largest award in architecture. According to William H. Scheick, executive director of the American Institute of Architects which administers the awards program, "This international award, now in its sixth year, is conferred on an architect who has designed a significant structure in which aluminum has been used creatively."

The award, which includes an original piece of sculpture designed by a prominent contemporary artist, is conferred by a jury of distinguished architects named by the A.I.A.

An architect may be nominated by anyone, including himself or his firm. Preference is given to buildings completed during the past three years. Nominations, which should include the architect's name and address, name and location of the structure, the date completed and the name and address of the person making the nomination, may be made by writing: The Reynolds Award, American Institute of Architects, 1735 New York Ave., N.W., Washington D.C. The award will be conferred during the A.I.A. convention May 7-11, 1962 in Dallas.

### Seminar on Architecture For Dallas School Teachers

The Dallas Chapter of the American Institute of Architects conducted a group of eight seminars on architecture for Dallas school teachers in September. Principals and teachers attending the full course of two-hour sessions were to receive Board of Education credit.

The first four sessions, conducted by John Harold Box, covered the total scope of architecture, architecture related to the individual, the

community and an architectural field trip.

The fifth seminar, conducted by Royden S. Bair and Frank Campbell, Dallas contractor, discussed form in architecture. The final three sessions were devoted to the design process, Harwell Harris discussing residence architecture, Donald Jarvis, office building architecture, and Enslie O. Oglesby Jr., school buildings.

### Rome Prize Fellowships Offered for 1962-1963

The American Academy in Rome is offering a limited number of fellowships for mature students and artists capable of independent work in architecture, landscape architecture, musical composition, painting, sculpture, history of art and classical studies.

Fellowships, which will be awarded on evidence of ability and achievement, are open to citizens of the U.S. for one year beginning Oct. 1, 1962, with possibility of renewal. The award carries \$3000 a year; a senior research fellowship, offered only in classical studies, carries \$4000.

Applications and submission of work, in the form prescribed, must be received by Dec. 30, 1961. For details, write the Executive Secretary, American Academy in Rome, 101 Park Ave., New York 17.

### "SONGS FOR ARCHITECTS AND THEIR GIRL FRIENDS": A NEW ALBUM BY ROBERT SCHMERTZ

Afficionados of Robert Schmertz—i.e., all who have heard him—will be delighted to hear that there is a new recording of his songs. It is candidly and appropriately entitled "Ladies Beware of an Architect: Songs of Architects and Their Girl Friends"; and in the opinion of this particular aficionado, it is the best record of all.

Those who have never heard him should know that Robert Schmertz is an architect (F.A.I.A., in fact) in Pittsburgh; and a member of the faculty of the School of Architecture at Carnegie Institute of Technology, who has been for years lovingly and knowingly making ballads about architects and architecture (among other things) and singing them to the accompaniment of his banjo.

The new songs in the current album ought to provide some reassur-

ance for people who fear that architectural criticism is dead (or at any rate dispirited). The Schmertz approach is always amiable, but often pretty direct: "When that architect comes to Jordan will he cross?" (reflections on certain deviations in current architectural practice); or "Walter and Mies and Corbu"—"if you can endure just pure architecture, get Walter or Mies or Corbu!" One of the most memorable of the new songs is a wistful recollection of Beaux Arts days in Paris "When I Was a Young Nouveau."

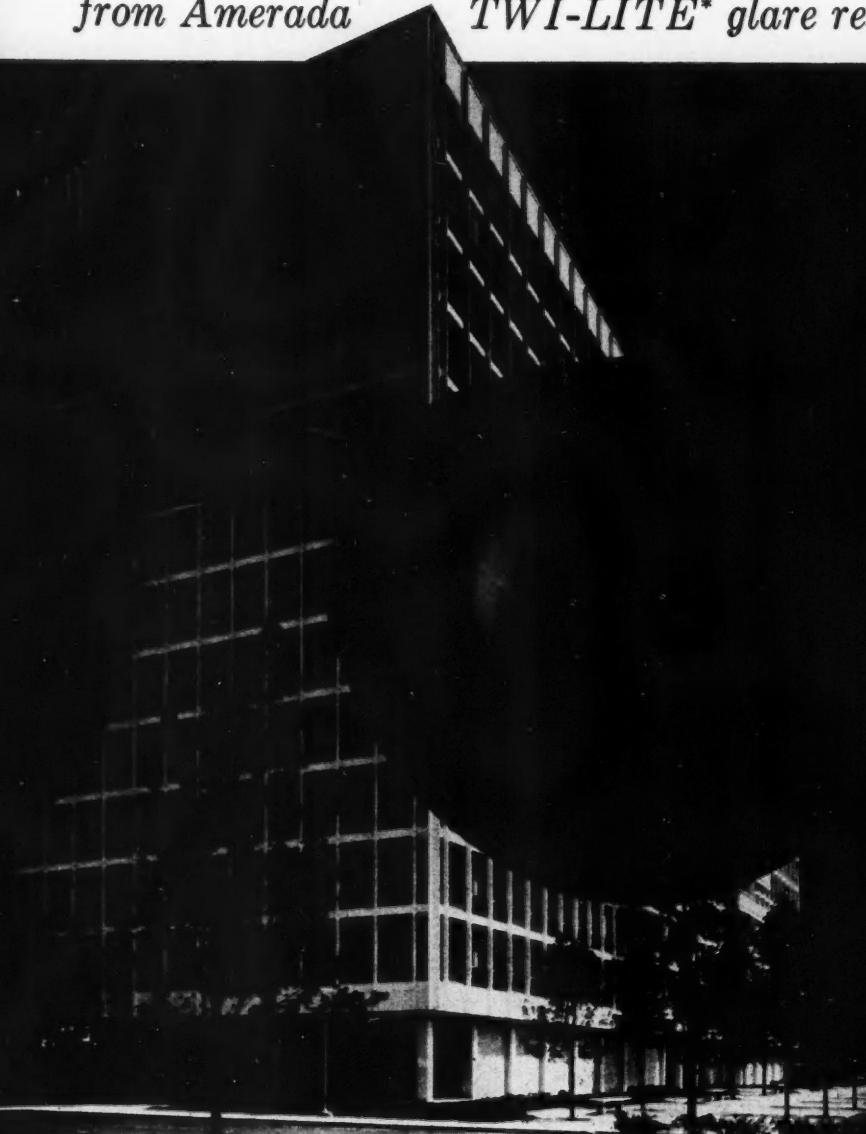
Altogether the new album has 13 songs, of which seven are published for the first time. The album can be ordered at five dollars from Mrs. Robert Schmertz, 5910 Howe Street, Pittsburgh 32, Pennsylvania.

more news on page 83

from Amerada

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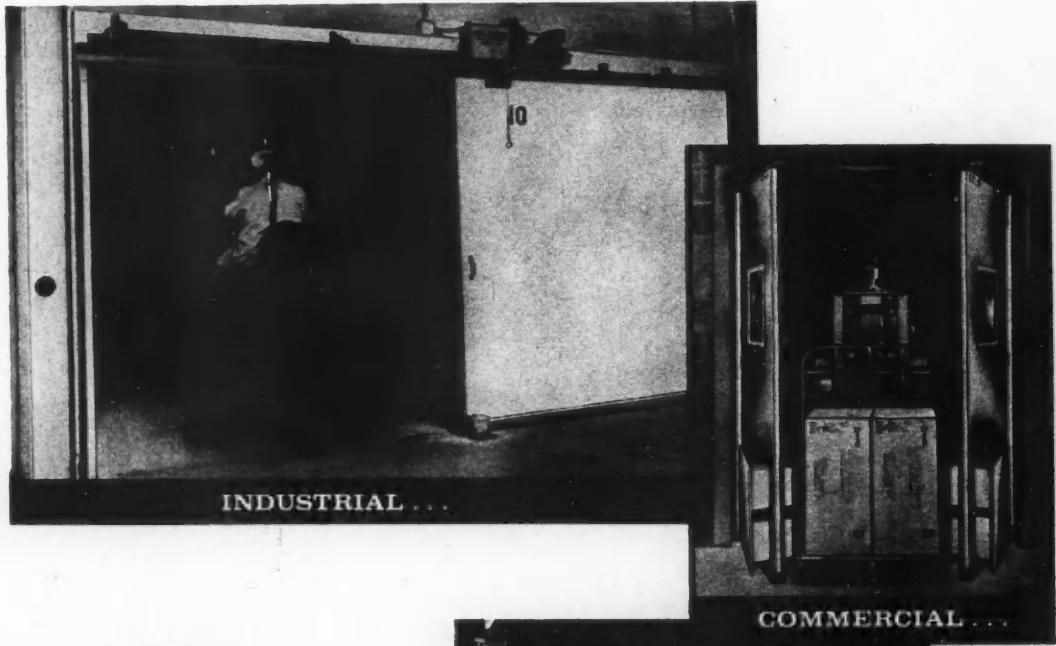
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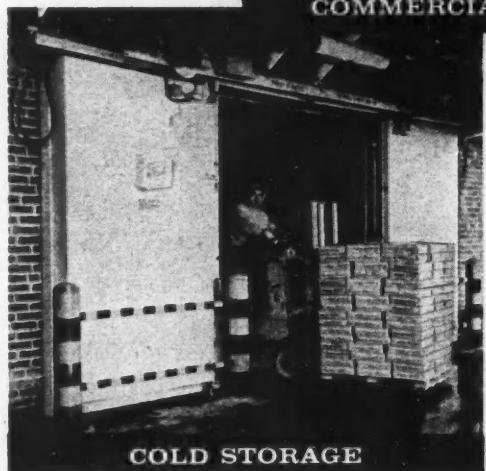
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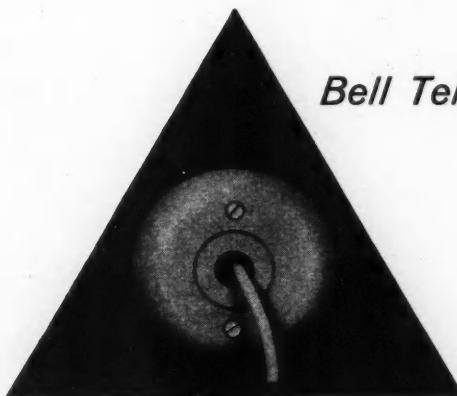
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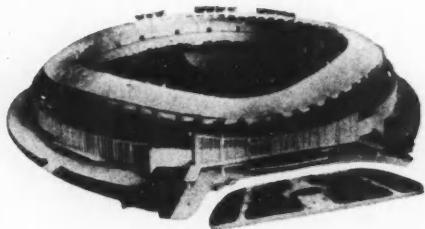


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# Circular stadium is full of angles

*... and Bethlehem Steel Pipe was "rolled" through dozens of them*

From start to finish, the new District of Columbia Stadium in Washington was built to please the customers. From the radiant-heated seating section alongside the field, to the cantilevered roof sheltering most of the 50,000 column-free seats, spectator comfort was the designer's aim.

28 water fountains are located around the stadium. Food and drink concessions—each with its own sink and drain—occupy some 800 linear ft along the walkways. And the 45 public rest rooms are equipped with an average of over 20 fixtures each.

## A unique piping challenge

Piping the stadium was a job unlike any other. To start off with, the stadium is round, like the plan view of a doughnut with a 700-ft OD. It was built in 66 sections, each resembling a 5-level, truncated

Bethlehem 6-in. pipe "rolls" along under the ceiling—with the help of two 11½° fittings. The job required about one ft of steel hanger rod for every three ft of steel pipe. Some 18,500 ft in all.

"pie"-shape with its side lines radiating from a point in the middle of the playing field. The upper levels are cut through by 66 huge, sloping cantilever beams, joined together with great box struts and wide-flange beams. Because of the undulating roof line, the position of this steelwork changes from section to section. This, plus the variously located services, required that the piping be laid out individually for almost every level of every section.

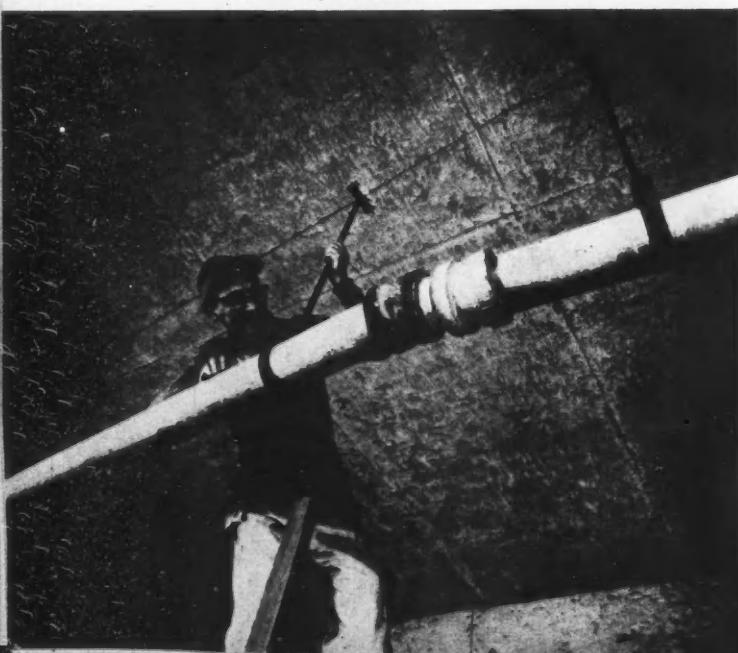
## "Roll 74°"

As a result, very little straight-line piping was possible. And the common elbows were all-too-often inadequate to handle the odd angles required. "Rolling" the pipe around obstructions, using combinations of the rare 11¼° and 22½° fittings, became the rule rather than the exception. Almost every field sketch (there were hundreds) bore several notations, such as "roll 74°", or "roll 28°".

## 250 tons of steel pipe

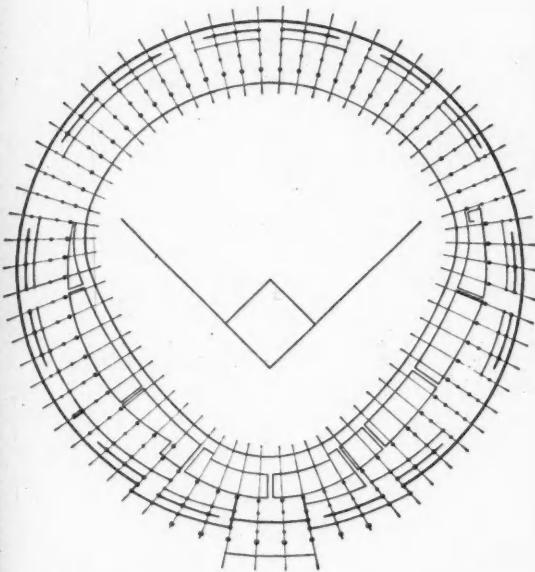
The project includes thousands of feet of storm drainage lines, water supply lines, sanitary vents and waste lines, and lines supplying the heating and air-conditioning system. In all, over 61,000 ft of Bethlehem black and galvanized steel pipe were used, ranging in size from 1½ in. in continuous butt-weld, to 12 in. in electric resistance-weld.

Owner: District of Columbia Armory Board  
Architects and Engineers: Dahl-Erwin-Osborn  
General Contractor: McCloskey & Co.  
H, P, & AC Contractor: Lloyd E. Mitchell, Inc.  
Pipe Distributor: Sanitary Supply Company, Inc.

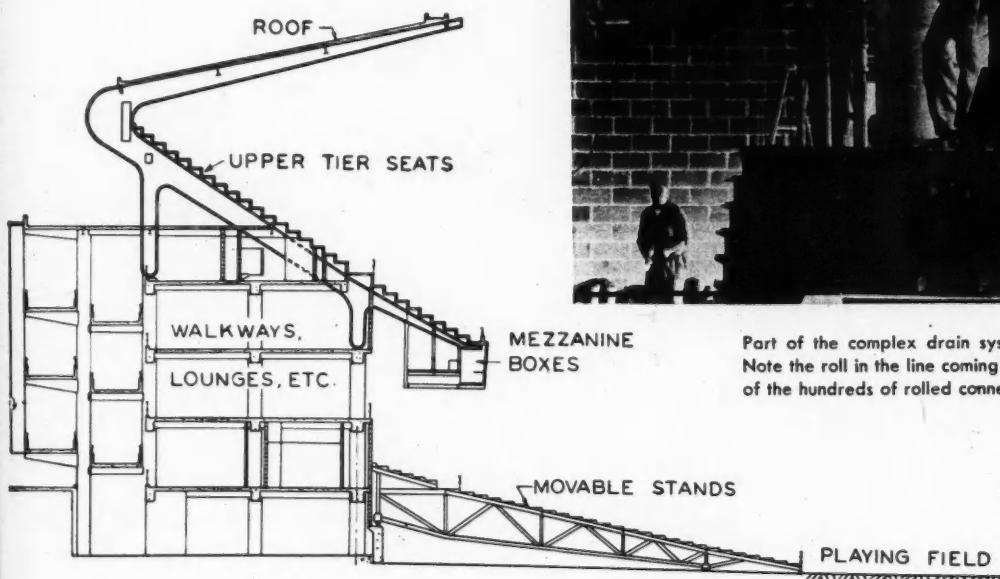


**Insist on Steel Pipe  
Made in U.S.A.**





These simplified plan and section drawings clarify the stadium's novel design—and the problems which confronted the service contractors. Structurally, only 28 of the 66 sections, and no two of the six levels, are similar. Many of the services' layouts could be determined only at the job site.



Part of the complex drain system on the fourth level. Note the roll in the line coming through the ceiling—one of the hundreds of rolled connections necessary.

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WESTERN SECTION EDITOR: Elisabeth Kendall Thompson, A.I.A.

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## Conversation At Noon; Or, Criticism On The Half-Shell

"You're a critic, aren't you?" the young man on my right asked at a recent civic luncheon. "Decidedly not," I replied.

"Oh!" he said in surprise. "You aren't? But you *do* write about architecture, don't you?"

"Yes," I said, "I write about architecture, but I don't qualify myself as a critic. I guess I'm just old-fashioned enough to believe first, that a critic is not self-styled; and then, since criticism involves judgment, that it must be made against some standard. It can't be criticism, in the true sense, when it is merely an expression of personal like or dislike. Most of what passes for criticism today—and is labeled so either by its authors or by those who print it—is personal opinion, not criticism."

"Of course a work of art—architecture can be that—will produce reactions of liking or disliking. That's inevitable. And of course it's impossible to divorce the subjective reaction from the absolute worth of the work of art. But if one's likes and dislikes are to be paraded in print, the least the so-called critic should do is to stack his likes and dislikes up against that somewhat intangible thing we call a 'standard'—which, after all, is the sum of a person's experience and knowledge. If a person has no experience and only a little knowledge, his 'standard' doesn't mean much."

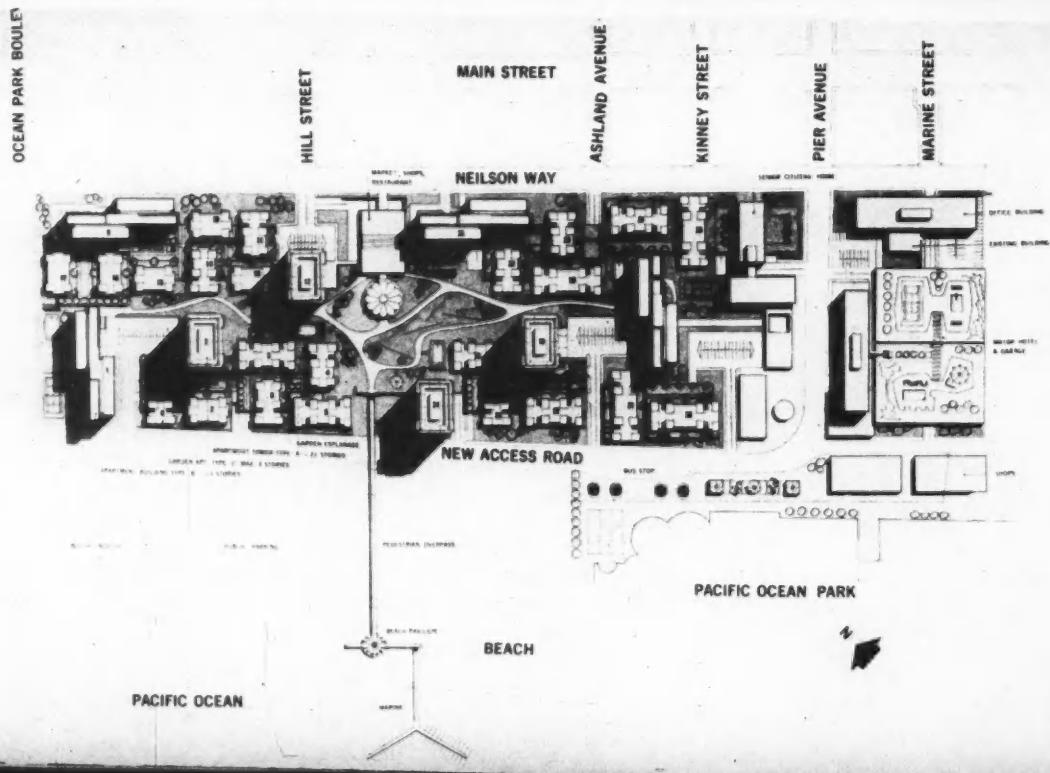
"I never thought of it like that," the young man said. "Yes, most of what I read as architectural criticism is someone's personal preference for or against a building or a complex. Why aren't there others besides Mumford who measure against a standard?"

"A quick answer—bound to be superficial, so forgive it—would be that you don't become a critic overnight—not a real critic. A good many of our 'critics' today are 90-day wonders. Why, you can even take a course in critical writing—and become a critic! You learn the lingo, find out who the right people are in the field of which you've decided to be a critic, pick the right brains and presto! you're a critic. You don't really have to know anything about the field itself; this makes it much easier to criticize. When you know both sides of a problem, the judgment can never be black against white; you see the black *and* the white, and the true critic, equipped with his intangible and hard-won standard, judges which takes precedence. But he is always aware of the shadow cast on the white by the black, and of the light cast on the black by the white. And for this reason, whatever his personal predilection, his criticism is fair, lucid and calm."

"But isn't it good for architects that this kind of recognition is coming to them?" asked my inquisitor.

"That's a whole new field of conversation," I answered. "Let's do that next month—we need shish kebab on a flaming sword to do that subject justice!"

E.K.T.



## KERN-WEBB'S PROPOSAL, BECKET DESIGN CHOSEN FOR OCEAN PARK PROJECT

With almost no fanfare except in the city itself, a decision was announced which will broadly affect the future of a large part of Santa Monica: the choice of developer for the 26-acre Ocean Park redevelopment project fell on the Kern County Land Company—Del Webb Corporation proposal and the design which they had commissioned Welton Becket and Associates of Los Angeles to make for them. The decision had been a long time in the making. Since last spring, when eleven proposals were received by Santa Monica's Redevelopment Agency, every aspect of each one had been carefully studied by the 120-member Citizens' Progress Committee which reported to the Agency its evaluation of them.

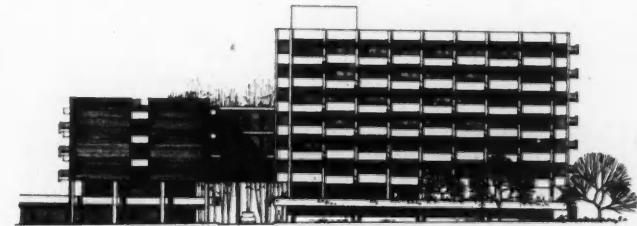
The final decision echoed the Committee's first findings. In their June 5 report to the Agency on the "Plan Concept and Architectural Attractiveness" of the proposals, the Committee—which includes eight architects among its members—found that the Becket design rated higher on its score card than any of the others.

The design divides the residential portion of the project into four neighborhoods, each with two high-rise buildings and a number of two- and three-story garden apartments situated on the landscaped decks of below-grade parking garages. Four towers will have 21 floors, four will have 13. Neighborhoods are separated from each other by greenbelts which merge into a central park, open to the ocean, with a circular restaurant. The commercial portion of the project will contain a 147-unit senior citizens' apartment building, a six-story general office building, an eight-story 280-unit motel and a parking garage for 856 cars with a landscaped roof deck.

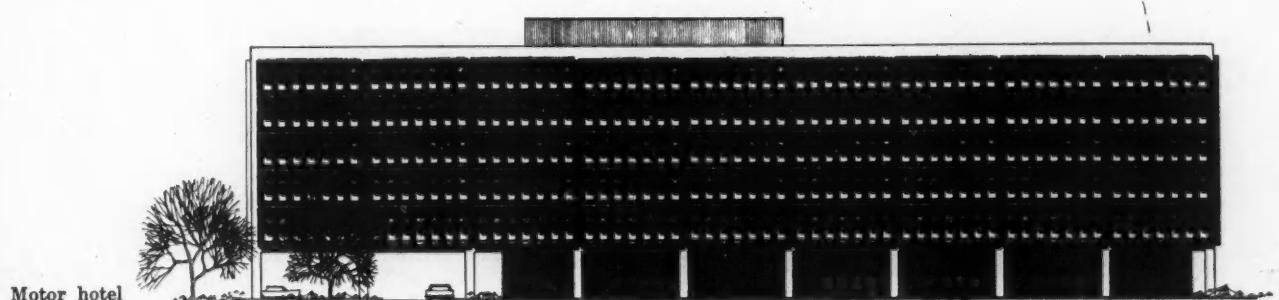
Kern-Webb offered \$5,800,000 for the 18-acre residential land, a \$103,000-a-year lease on the commercial section, and a promise that all improvements in this section would revert to Santa Monica after 50 years.



Garden apartments



Apartments for senior citizens



Motor hotel



## WESTERN ARCHITECTS AND ENGINEERS MEET FOR ANNUAL CONFERENCES

### NORTHWEST REGION, A.I.A., CONFERENCE, HONOLULU

It was a small conference in size of mainlander attendance, but its theme was large and provocative: *Vanishing Boundaries*—in Art, in Society, and in Architecture. And the “aloha” with which the Hawaii chapter made the delegates and their wives welcome to Honolulu for the tenth annual conference of the Northwest region, A.I.A., was inversely proportional to the size of the group. From the first aloha breakfast to the beautiful and moving Hawaii pageant and luau, from the official conference events to the post-conference aloha parties in Honolulu architects’

*continued on page 32-10*

Hawaii chapter president Clifford Young welcoming regional director Weller under conference symbol designed by Honolulu artist Edward Brownlee. Speakers Raymond and Griffing with Mrs. Raymond and Ted Jacobsen of Honolulu

Antonin Raymond of New York and Tokyo, George “Pete” Wimberly and Val Ossipoff, of Honolulu. Mrs. Weller, regional director Harry Weller of Pullman, Wash., with conference chairmen Mansel and Robert Law of Honolulu

S.E.A.C. president Walter D. Buehler and technical program chairman Joe Dobrowolski, both of Sacramento. Albert Dreyfuss, Central Valley A.I.A. president, with San Francisco consulting engineer John Blume, who was a speaker. Sacramento civil engineers R. W. Brandley and J. S. Barrish

Kenneth Venolia, host chapter president, with speakers Carl Johnson, Los Angeles, president Buehler and Ray McCann of Napa, also a speaker. Convention chairman Charles M. Herd, Sacramento

Author Eugene Burdick with Donald Reay, F.R.I.B.A., both from Berkeley, Calif. Kenneth Brooks, A.I.A., Spokane, and A.I.A. first vice president Henry Wright of Los Angeles, honor award jury members. San Francisco’s redevelopment director Justin Herman, panelist

Chapter presidents David Swanson, Tucson, S. W. Arizona; Miles Brittelle, Albuquerque, New Mexico; Lloyd Snedaker, regional director; Graham Erskine, Reno

### STRUCTURAL ENGINEERS ASSOCIATION OF CALIFORNIA, SACRAMENTO

Over 400 structural engineers, their wives and guests met in Sacramento for the 30th annual convention of the Structural Engineers Association of California, with the Central California chapter as hosts for the first time. A neatly balanced program of technical sessions and social events kept the convention-goers on the go for three days.

Highlight of the technical program was the session on job problems, with discussion of unusual design problems on three specific jobs, described by their engineers: Carl Johnson of Los Angeles gave details of guniting the parabolic shell vaults of an auditorium roof; W. A. Campbell of Sacramento described pile foundations for a warehouse in Puerto Rico; and R. W. Brandley of Sacramento, a bridge on a yielding foundation. Running this feature a close second for interest was the field trip to Walnut Grove to visit the 1550-ft television tower for which John Minasian is the engineer.

*continued on page 32-10*

### WESTERN MOUNTAIN REGION, A.I.A., RENO

With “Public Agencies in Community Development: The Politics of Architecture” as its theme, the tenth annual conference of the Western Mountain Region, A.I.A., provided a program of stimulating and thought-provoking speakers from varied backgrounds for the slightly more than 100 architects and wives who came to Reno from six mountain states.

The three non-architect speakers—M. Justin Herman, San Francisco’s redevelopment director, Eugene Burdick, author and professor at the University of California, Berkeley, and writer Allan Temko—offered suggestions to architects for their roles in “the politics of architecture”: “Work with imaginative vengeance on elevating the public taste—the public official will then be in a situation where

*continued on page 32-12*

# Western Cost Construction Indexes

Presented by Clyde Shute, Director of Statistical Policy, Construction News Div., F. W. Dodge Corp., from data compiled by E. H. Boeckh & Assoc. Inc.

## Labor and Materials: U.S. average 1926-1929=100 DENVER

## LOS ANGELES

PERIOD	RESIDENTIAL		APTS., HOTELS OFFICE BLDGS.		COMMERCIAL AND FACTORY BLDGS.		RESIDENTIAL		APTS., HOTELS OFFICE BLDGS.		COMMERCIAL AND FACTORY BLDGS.	
	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel	Brick and Concrete	Brick	Frame	Brick and Concrete	Brick and Concrete	Brick and Steel	
1939	112.0	112.1	116.1	117.8	117.0	97.2	93.6	103.7	104.9	106.2		
1948	217.8	218.1	202.7	207.0	206.7	215.9	216.5	205.8	210.0	209.8		
1949	215.8	212.9	211.0	215.3	214.6	207.0	203.2	209.9	212.4	210.2		
1950	230.0	228.2	218.8	221.3	221.2	224.1	222.8	217.4	219.0	217.5		
1951	249.7	246.6	236.5	237.2	238.9	241.0	239.5	235.1	236.9	236.6		
1952	253.6	249.4	243.4	245.1	245.6	243.8	241.7	239.8	242.6	241.5		
1953	259.6	254.0	255.0	260.9	258.1	250.5	246.5	252.3	258.2	255.3		
1954	258.9	252.0	259.1	266.2	263.4	251.0	245.3	257.7	265.7	261.8		
1955	266.6	260.9	266.3	273.2	271.7	262.1	256.6	269.3	278.0	273.9		
1956	274.9	269.3	275.8	282.3	285.1	272.6	266.7	282.9	292.9	289.3		
1957	281.3	272.2	285.4	293.1	296.4	275.4	267.9	292.8	303.3	303.7		
1958	282.2	272.0	288.1	295.9	298.8	277.9	286.6	302.6	314.5	316.4		
1959	288.7	278.9	295.2	302.9	304.8	288.7	279.1	314.9	326.9	327.6		
1960	292.2	282.7	301.3	309.0	310.0	299.8	287.7	329.1	342.7	339.6		
June 1961	297.1	286.6	310.8	320.6	313.6	307.6	292.1	343.7	359.8	350.8		
July 1961	297.1	286.6	310.8	320.6	313.6	307.6	292.1	343.7	359.8	350.8		
Aug. 1961	298.0	288.6	312.4	320.8	314.2	306.2	290.3	343.4	359.6	350.4		
	% Increase over 1939					% Increase over 1939						
Aug. 1961	166.1	157.4	169.1	172.3	168.5	215.0	210.1	215.9	242.8	229.9		

## SAN FRANCISCO

## SEATTLE

1939	105.6	99.3	117.4	121.9	116.5	104.4	96.7	119.2	125.3	118.7	
1948	218.9	216.6	208.3	214.7	211.1	216.3	211.4	211.5	216.6	216.9	
1949	213.0	207.1	214.0	219.8	216.1	214.2	203.9	220.7	228.5	225.3	
1950	227.0	223.1	222.4	224.5	222.6	224.1	213.6	227.1	234.5	230.3	
1951	245.2	240.4	239.6	243.1	243.1	245.1	232.7	247.7	255.8	251.0	
1952	250.2	245.0	245.6	248.7	249.6	254.3	239.8	258.8	267.7	263.8	
1953	255.2	257.2	256.6	261.0	259.7	254.8	239.0	262.7	273.6	269.5	
1954	257.4	249.2	264.1	272.5	267.2	253.3	236.1	266.6	279.1	274.0	
1955	268.0	259.0	275.0	284.4	279.6	260.6	243.3	273.7	287.3	282.4	
1956	279.0	270.0	288.9	298.6	295.8	273.5	254.0	288.5	303.4	299.0	
1957	286.3	274.4	302.9	315.2	310.7	275.6	254.0	298.2	313.1	311.2	
1958	289.8	274.9	311.5	326.7	320.8	279.9	256.4	306.0	324.0	320.8	
1959	299.2	284.4	322.7	338.1	330.1	291.5	267.8	318.8	336.9	331.8	
1960	305.5	288.9	335.3	352.2	342.3	298.9	272.4	330.5	351.2	342.9	
June 1961	310.8	292.4	346.9	364.8	352.1	296.2	268.1	335.2	357.3	345.4	
July 1961	311.8	293.8	347.4	364.6	351.2	296.2	268.1	335.3	357.3	345.4	
Aug. 1961	311.6	293.5	349.0	365.3	353.4	297.4	268.7	336.8	359.7	346.3	
	% Increase over 1939					% Increase over 1939					
Aug. 1961	195.1	195.6	197.3	199.7	203.3	184.9	177.9	182.5	187.1	191.7	

Cost comparisons, as percentage differences, for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.:

index for city A = 110

index for city B = 95

(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

$$\frac{110-95}{95} = 0.158$$

Conversely: costs in B are approximately 14 per cent lower than in A.

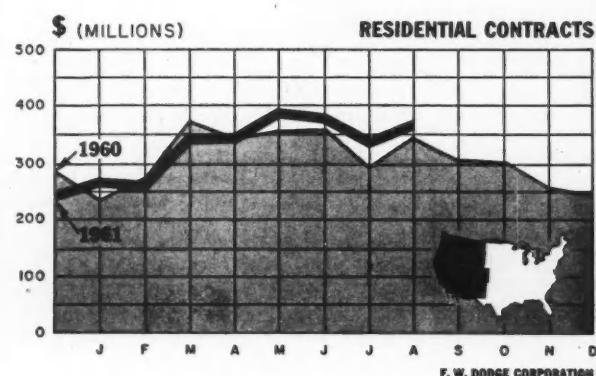
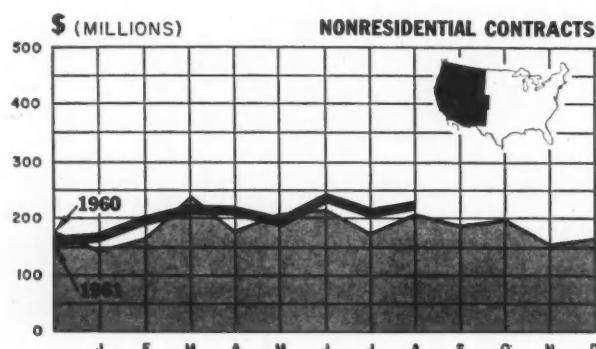
$$\frac{110-95}{110} = 0.136$$

Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926-29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published list prices, thus indexes reflect minimum costs and not necessarily actual costs.

## Western Construction Trends

(For analysis of construction trends nationwide, see page 24.)



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Construction in the West continued to forge ahead during August with a seven per cent gain in contract valuation over the same month last year. Total contracts amounted to \$749,241,000.

Percentage increases were spread fairly evenly among the three sectors of construction. Contracts for nonresidential buildings went up seven per cent to \$222,760,000; residential building contracts rose six per cent to \$370,554,000; and heavy engineering projects were valued at \$155,927,000, up eight per cent.

Within these broad classifications, however, there were some outstanding performances by certain construction types. Apartment building again sparked the residential sector. In nonresidential building, both school contracts and manufacturing building contracts rose sharply in

August, the latter almost doubling their year-earlier figure.

Actually, these two building types have done considerably better in the West thus far this year than they have nationally. Eight months' contract totals for manufacturing plants in the 11 Western states ran two per cent ahead of the same period last year, while nationwide contracts dropped 16 per cent. In the educational and science building category, Western contracts for eight months chugged along 11 per cent ahead of year-earlier levels, but for the country as a whole were up only three per cent.

The gain in Western school building is particularly encouraging, because of the spotty record of this vital construction category in recent years. In 1960, school contracts in the West showed a good increase over

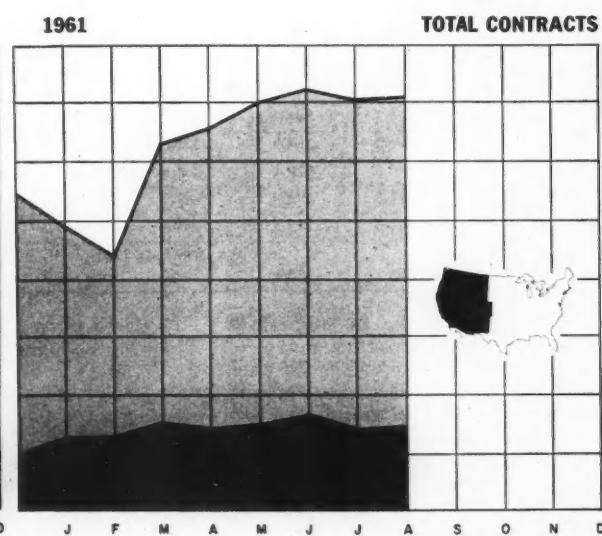
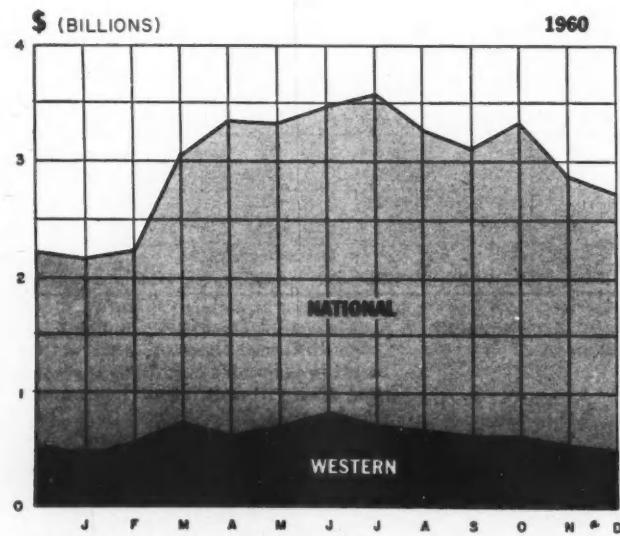
1959, but were still considerably below the peak year of 1958, when contracts amounted to \$609 million. However, if the 11 per cent gain registered for the first eight months of 1961 can be maintained for the year as a whole, school construction will reach another new high.

School building now accounts for a little over a quarter of all non-residential building, both in the West and nationally. A continued upward movement in so large a category is bound to have a potent effect on the whole market, and there is no reason to doubt that such a movement will occur.

EDWARD A. SPRAGUE

Economist

F. W. Dodge Corporation  
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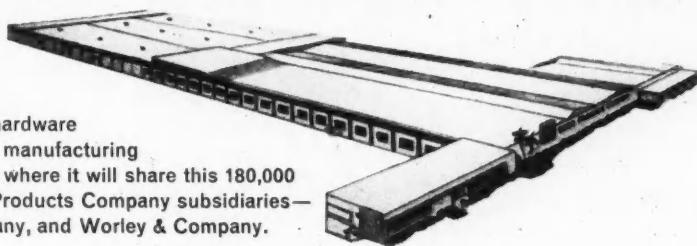


Total contracts include residential, nonresidential, heavy engineering contracts

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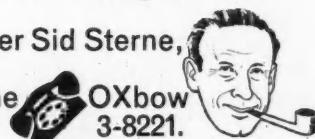


Kennatrack Corporation, world's leading sliding and folding door hardware manufacturer, has started branch manufacturing operations at Whittier, California, where it will share this 180,000 sq. ft. plant with two other Ekco Products Company subsidiaries—McClintock Manufacturing Company, and Worley & Company.



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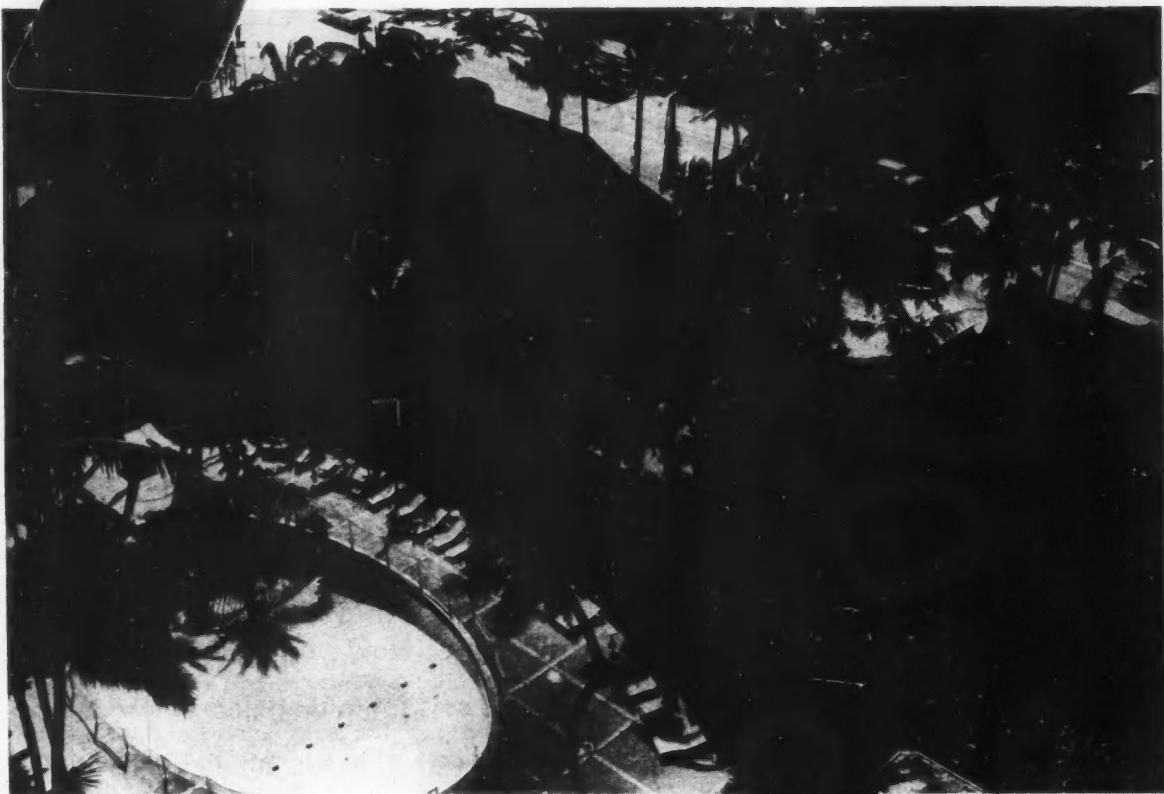


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Honolulu, Hawaii

#### ARCHITECT:

Gardner A. Dailey, F. A. I. A.  
San Francisco, Calif.

#### ROOFING TILE:

Ludowici Weathered Black Interlocking

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HAWAII REPRESENTATIVES Lowers & Cooke, Ltd., Honolulu

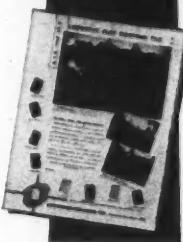
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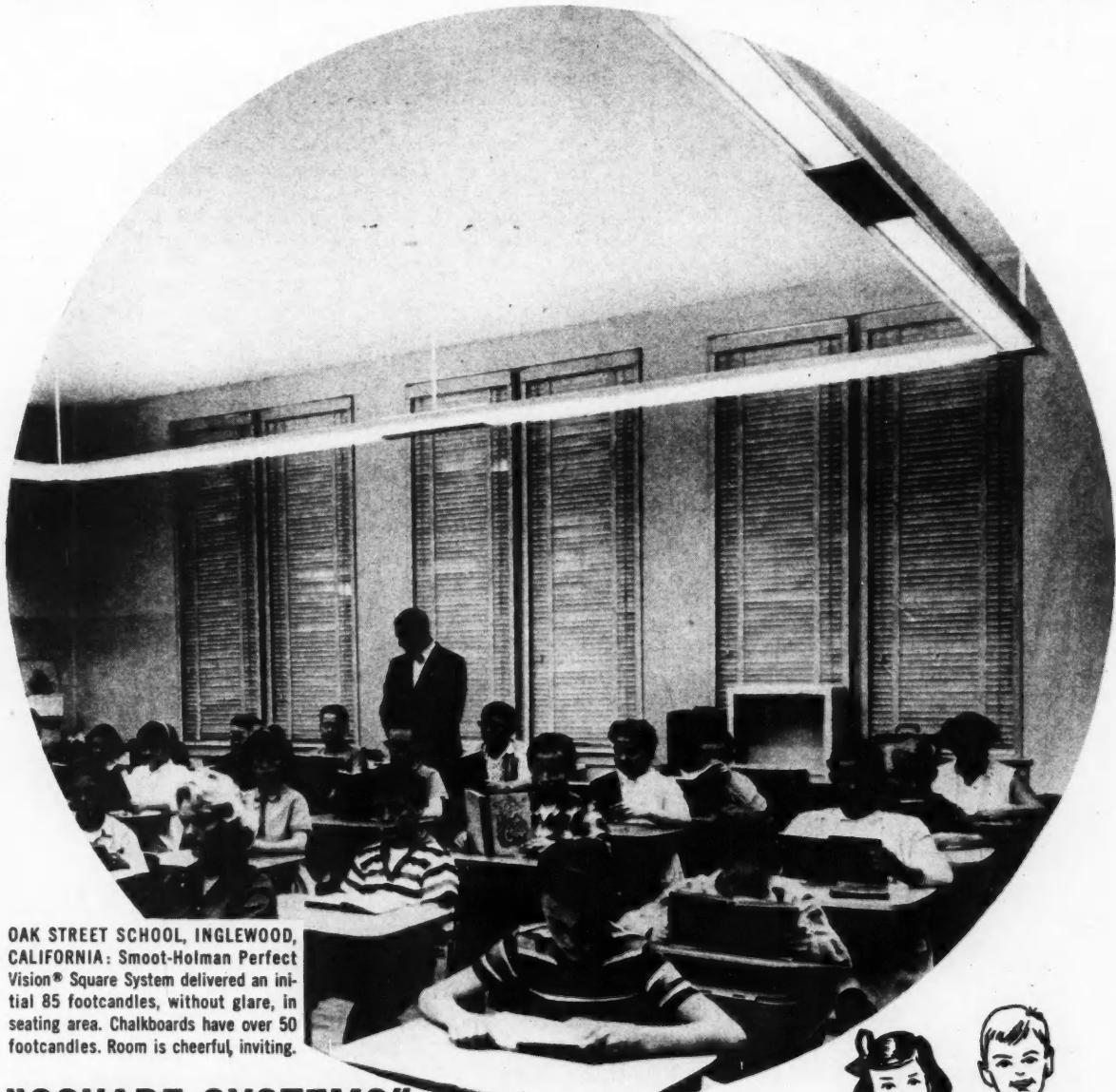
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Committee meeting on regional affairs: Grant Brower, Idaho; Hugo Osterman, Seattle; Douglas Freeth, Hawaii; Carroll Martell, Spokane. Regional director nominee-designate Robert L. Durham, Seattle, with S. W. Washington president John McGuire

#### NORTHWEST REGION A.I.A., CONFERENCE

*continued from page 32-4*

homes, the conference was an unforgettable experience of the essence of vanished boundaries—Island hospitality.

But it was the high caliber of the professional program which cemented the conference activities and provided the stimulus for which Northwest conferences are noted. With Antonin Raymond of international architectural fame, Dr. Alexander Spoehr, chancellor-elect of Hawaii's developing East-West Center, and Robert Griffing, director of the Honolulu Academy of Arts, as principal speakers, and Philip Will, A.I.A. national president, as banquet speaker, the program was further developed by panels of architect discussants.

Concern over the increasing mediocrity, conformity and size of design projects underlay the talks by the principal speakers. All agreed that some boundaries—in diversity, stylistic characteristics, scientific knowledge, technology—are indeed vanishing; as far as art—and architecture—is concerned, however, they regarded this as a not unmixed blessing. For, as both Dr. Spoehr and Mr. Griffing said, "without inter-cultural boundaries, art is rootless and hence without vitality." Antonin Raymond, out of his

long experience in practice in Japan, took a gloomy view of the great size and heaviness of contemporary Japanese buildings, drawing an unhappy analogy with other large structures built in times of revolutionary change and disintegration of social orders. The boundaries which once would have determined a Japanese approach to such buildings have disappeared in the rapid Westernization of Japan since World War II, he said.

Phil Will, summarizing the conference, suggested that what is needed is "a filtering screen to replace the vanishing boundaries, to admit the useful and valid and reject the inappropriate and spurious." The best such filter to date is, he said, the mind of man.

#### STRUCTURAL ENGINEERS ASSOCIATION

*continued from page 32-4*

A special report on a three-year study of California school buildings made by John Blume and Associates for the California Division of Architecture was presented by John Blume. The study indicates, Blume said that earthquake resistance provisions in low-rise buildings cost very little more, if anything, than normal good practice in design. It also showed that unlike tall buildings, schools of one, two and three stories cannot be too rigid in their structures. Getting shear walls in proper locations is still a problem, he said, where architects want open flexible spaces, but the shear wall is necessary for rigidity and lateral force resistance. Important code changes should

*continued on page 32-12*

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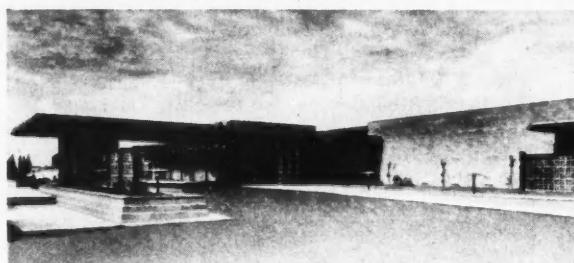


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#### STRUCTURAL ENGINEERS ASSOCIATION

*continued from page 32-10*

be considered, Blume concluded, as a result of the research study, first to consider buildings of this type.

Reports on legislative problems, by LeRoy Greene, president of the California Legislative Council of Professional Engineers, and of the recent conference on soil mechanics and foundation engineering, by R. W. Brandley, and a description of the structure of a twin-tower 50-story apartment building in Chicago rounded out the program.

#### WESTERN MOUNTAIN REGION, A.I.A.

*continued from page 32-4*

he will no more neglect the esthetics of a building he is authorizing than be indifferent to whether the building has plumbing or not," said Herman. "Top-notch architects should be doing architecture; they are better served by hiring someone skilled in politics to handle that for them," urged Burdick. "Courses in schools should be provided to awaken esthetic consciousness in the public and provoke demand for more effective city-scapes," proposed Temko.

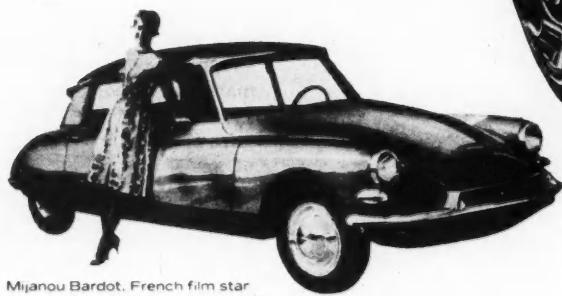
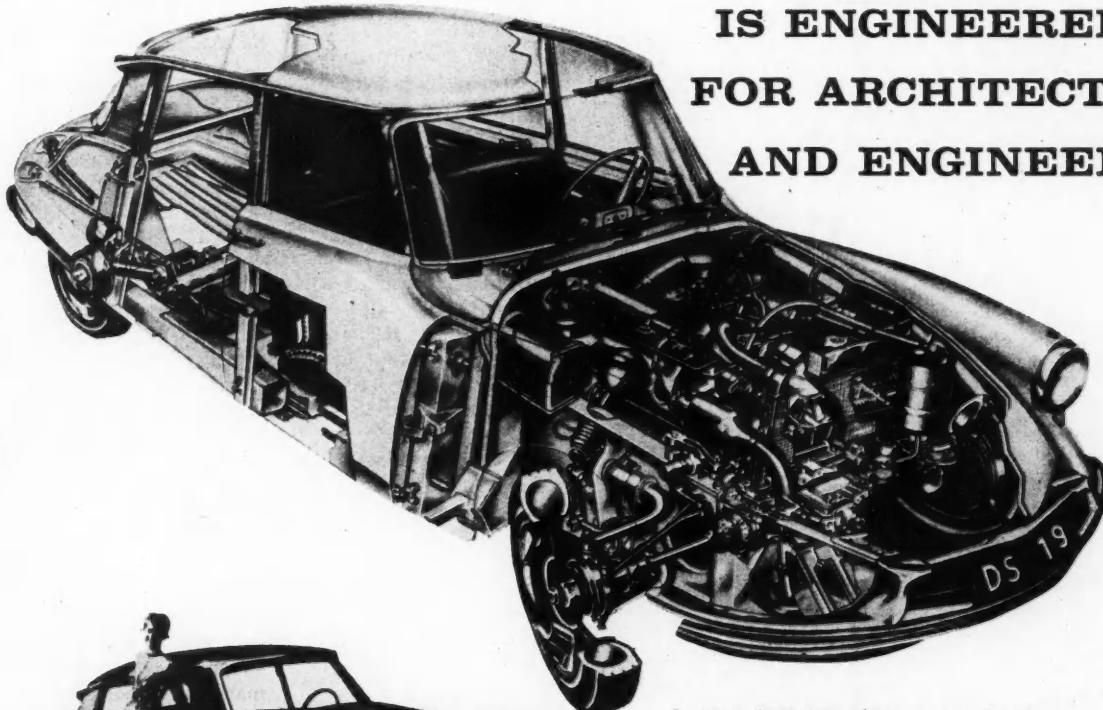
Architects Donald P. Reay, James M. Hunter, George Rockrise and Henry Wright also spoke. Reay outlined the two kinds of forces which shape cities (primary urgent forces like transportation, markets, school locations, social patterns; and secondary profound forces like man's interest in variety, human desire for identification, delight in moving in certain kinds of spaces). Hunter called for stronger leadership by architects to realize control of living environment. Rockrise described his chapter's program of participation in public concerns. And Henry Wright described the Institute's UD 62/63 program of seminars on urban design, intended to help the profession meet "its boldest challenge."

In the region's annual awards program, an honor award went to Donald Roark, Denver, for the office building for Madison Investment Company, Denver. Mentions went to Langdon Morris, Denver, for the Air Force Academy Golf Club, Colorado Springs; Ferguson, Stevens, Mallory and Pearl, Albuquerque, for the East Telephone Building addition, Albuquerque; and to Dean L. Gustavson for the Joseph Merrill Engineering Building, University of Utah, Salt Lake City.



James M. Hunter, A.I.A. second vice president, and Northern California A.I.A. president George Rockrise, jury members. University of Arizona's Fine Arts School dean Sidney W. Little with Reno architect David Vhay

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*Rain Bird Sure-Quick Turf Valves* eliminate hazard of surface obstruction and are used with *Rain Bird Sprinklers* for large area coverage. Available in many types and sizes.

Performance Charts and Catalogue sent on request. Also, courtesy service to architects in sprinkling system layout.

**NATIONAL RAIN BIRD SALES & ENGINEERING CORP.**  
 627 N. San Gabriel Ave., Azusa, Calif.

**BOECKH'S MANUAL  
 OF APPRAISALS**

5th Edition — just published

Over 100,000 individual unit costs—more than 300 buildings, with hundreds of variations, all easily converted to local cost conditions.

**YOU CAN FIGURE YOUR BUILDING COSTS**  
 ..... quickly and accurately .....

**BUILDING COSTS** — published monthly

A supplementary service giving an analysis of current market conditions and latest cost indexes for the major metropolitan areas of the U. S. and Canada to convert to local cost conditions.

**SEND TODAY FOR  
 COMPLETE DETAILS**

E. H. Boeckh & Associates  
 1406 M Street, N. W.  
 Washington 5, D. C.



## Waste Space

### Oh, to be an Engineer!

Engineers' incomes are higher than they have ever been, says a recent survey made by the National Society of Professional Engineers. The median income of the 24,326 respondents to a questionnaire on incomes turned out to be \$10,660 a year—up 6.6 per cent from the last such survey, made in 1958. That's a median, not average, income: half the respondents made more, half made less than that figure.

But don't get excited about *your* structural engineer's income. He's in the under-the-median class along with the other civil engineers. The top incomes go not to civil engineers but to self-employed mining and metallurgical engineers who live in the northeastern states; civil engineers who live in the northeastern states; civil engineers who live in the West, even if they are self-employed, don't do nearly so well. In fact the only group of engineers who are in a lower income class than civil engineers are agricultural engineers. Evidently, although agricultural engineers probably know how to dig, the real dough must have to be mined.

### Art is Long—Suffering, That Is

A new note swept through the recent convention of the Structural Engineers Association of California—one more often heard in the halls of architectural domains than in engineering circles. In a technical session on seismic forces, the point was repeatedly made that engineering is more than the science it has so long been called.

You can't get away from accurate and special calculations, Roy Johnston had said earlier; code generalities don't cover all situations. Good design, he said, doesn't come from blind adherence to codes. John Rinne said it differently, but it added up to the same thing: a set of rules can't help but be an over-simplification and should be used by the structural engineer to stimulate his intellect to exercise his best judgment.

And finally, at the last technical session, John Blume pronounced it loud and clear: engineering, he said, is not a science but an art. The engineer needs all the knowledge, all the experience that are required of a science. But he needs more: he needs common sense. And there are plenty of times when he has to use it.

### The Handrail on the Stair

Why do Japan's younger architects design "structures which are enormous and heavy, where economy of means would seem sensible and stolid"? Antonin Raymond, speaking at the Northwest region, A.I.A. conference in Hawaii last month, had an explanation:

"These architects seem to be carried away by a vision of permanence, solidity, power, enormity of scale as an end in itself. This novel departure—novel since World War II—seems to satisfy an inner craving, far stronger than reason. When explanations are called for, the arguments in favor have the childish flavor of neophytes seeking to justify a luminous vision. The gigantic columns support the gigantic beams which demand gigantic foundations—and all the details fit the picture: the handrails on the stairs are not intended for the human grasp."

A devastating commentary. And yet, who over here is willing to cast the first stone? In our way we, too, are guilty of ignoring the human grasp.

E.K.T.



*The Dramatic Texture of Fabric . . . The Gleaming  
Beauty of Glass . . . now artfully combined in*

**NEW**

# **BURLAP** BY MISSISSIPPI

Exceedingly brilliant and sparkling, highly obscure, new Burlap, figured glass by Mississippi has excellent diffusing properties and its functional and decorative applications are limited only by the imagination. Use it lavishly or sparingly and gain light, drama, distinction. Burlap glass is available at your nearby quality glass distributor. Free sample on request.



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GLASS COMPANY**

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NEW YORK • CHICAGO • FULLERTON, CALIFORNIA

Thickness	Approx. Light Transm'	Weight Unpacked Lbs.-sq. ft.	Maximum Sizes Untreated	Maximum Sizes G-R 2 Sides	Maximum Sizes G-R 1 Side
1/8"	87.5%	2.0	48 x 132	48 x 132	48 x 132
3/16"	85.9%	2.8	60 x 132	60 x 132	60 x 132

Recommended primarily for partitions; also shower doors and stalls, and kindred uses.

**YES! MR. ARCHITECT...**

**Miller** 

**DOES STAND FOR TOP  
QUALITY IN THE SLIDING  
GLASS DOOR FIELD...**

Daniel, Mann, Johnson, & Mendenhall, architects and engineers. Peter Kiewit Sons' Co., contractors.

The new American Cement Company building, in Los Angeles (one of many Miller commercial installations throughout the world), selected Miller doors for their outstanding features, one of which is the positive weather stripping so important with air conditioning.

For commercial or residential installations, the Miller door is the door you can specify with pride, buy with confidence and use with complete satisfaction.

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**TEST  
PATCH  
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YOU WILL  
BE  
CONVINCED**

## Calendar of Western Events

- OPENING OCTOBER 28: The Arts of Thailand, California Palace of the Legion of Honor, Lincoln Park, San Francisco
- NOVEMBER 4-26: Paintings by William Keith, "Old Master of California," Oakland Art Museum, Tenth & Fallon Streets, Oakland
- NOVEMBER 18-JANUARY 1: Prize winners in 1961-62 A.I.A.-Sunset magazine Western Home Awards Program, M. H. de Young Memorial Museum, Golden Gate Park, San Francisco
- DECEMBER 1-3: Associated General Contractors of America, Northern California Section, Sheraton Palace Hotel, San Francisco
- DECEMBER 4-8: California Association of School Administrators, Mark Hopkins Hotel and Masonic Memorial Temple, San Francisco
- DECEMBER 11-15: Institute on Hospital Design and Construction, Statler-Hilton Hotel, Los Angeles
- CLOSING DECEMBER 31: Folk Art of Lapland, Los Angeles County Museum, Exposition Park, Los Angeles
- JANUARY 25-27: Fourteenth annual California Streets and Highways conference, University of California at Los Angeles

## WESTERN SECTION

### Index To Advertising

Manufacturers' Pre-Filed Catalogs of the firms listed below are available in the 1961 Sweet's Catalog Files as follows:

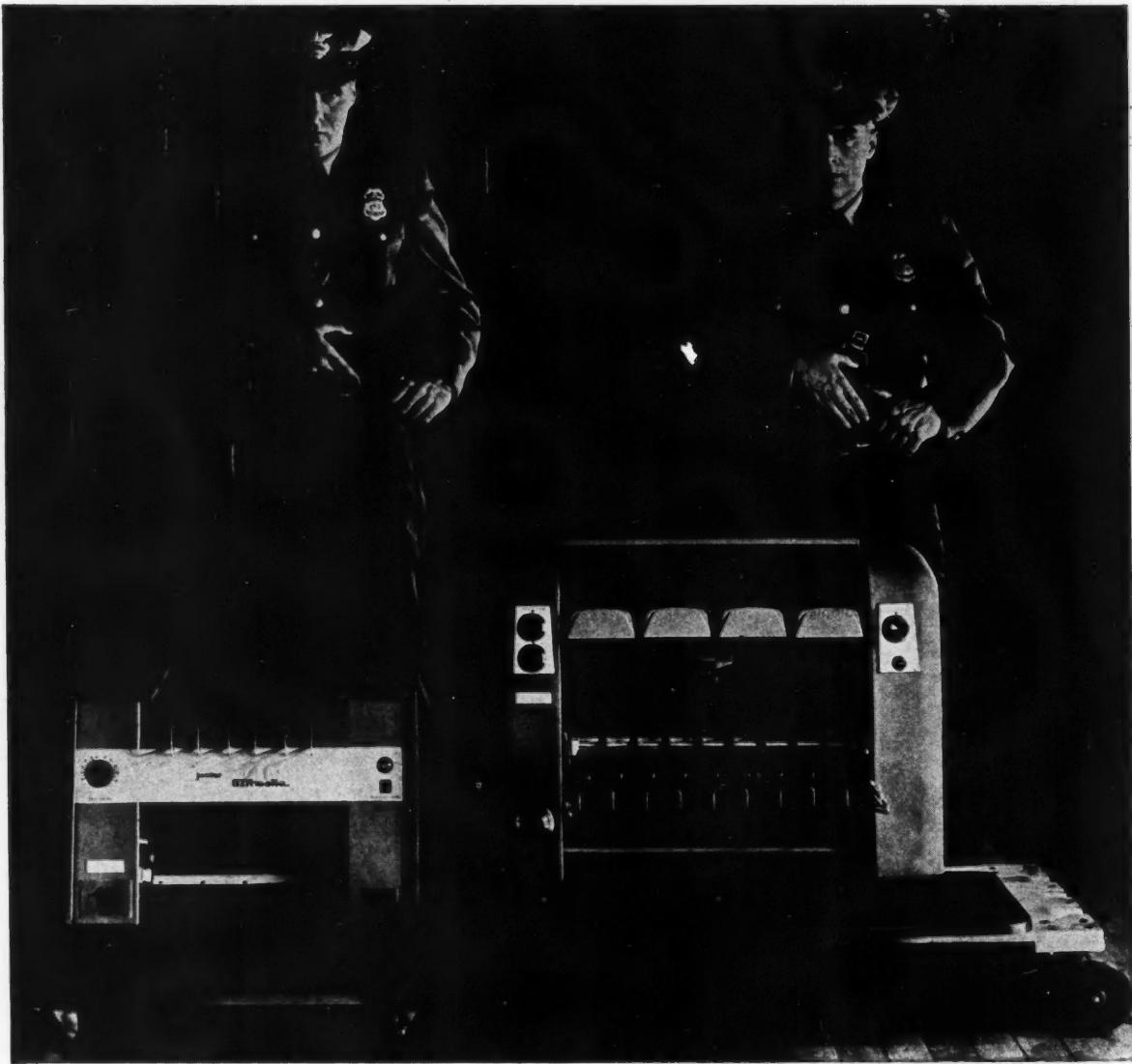
a Architectural File (green)  
ic Industrial Construction (blue)  
lc Light Construction File (yellow)

Page numbers of manufacturers' advertising elsewhere in this issue shown in italics

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Western advertising offices: LOS ANGELES, Wettstein, Nowell & Johnson, Inc., 672 S. Lafayette Park Pl.; PORTLAND, Wettstein, Nowell & Johnson, Inc., 921 S. W. Washington St.; SAN FRANCISCO, Wettstein, Nowell & Johnson, Inc., 417 Market St.

## Two Money-Making Machines from Ozalid



### New Junior Ozamatic®... New Super Ozamatic®

Here... trim and efficient as they look... are two versatile table top copiers by Ozalid. Both designed to increase profit by slashing copying costs. Consider:

For only a penny per print, Junior reproduces material up to 13" wide—office systems, small engineering drawings, routine paperwork, film positives. Super, most versatile in its class, processes any dry diazo material up to 19" wide. And fast... for one example... 2000 lettersize copies an hour.

For heavy volume engineering drawing reproduction, there's Ozalid's new Printmaster 900, a veritable workhorse for capacity.

Is your business, like thousands of others, feeling the cost-profit pinch? Get the facts on these Ozalid cost-cutters today. Facts that can begin saving you money tomorrow. Simply mail coupon.

**OZALID®**

Division of General Aniline & Film Corporation, Johnson City, New York  
REMEMBER, FOR PEAK EFFICIENCY, ALL OZALID WHITEPRINTERS WORK BEST WITH OZALID SENSITIZED MATERIALS

Mr. James A. Travis, Mgr., Marketing  
Ozalid, Dept. 235, Johnson City,  
New York

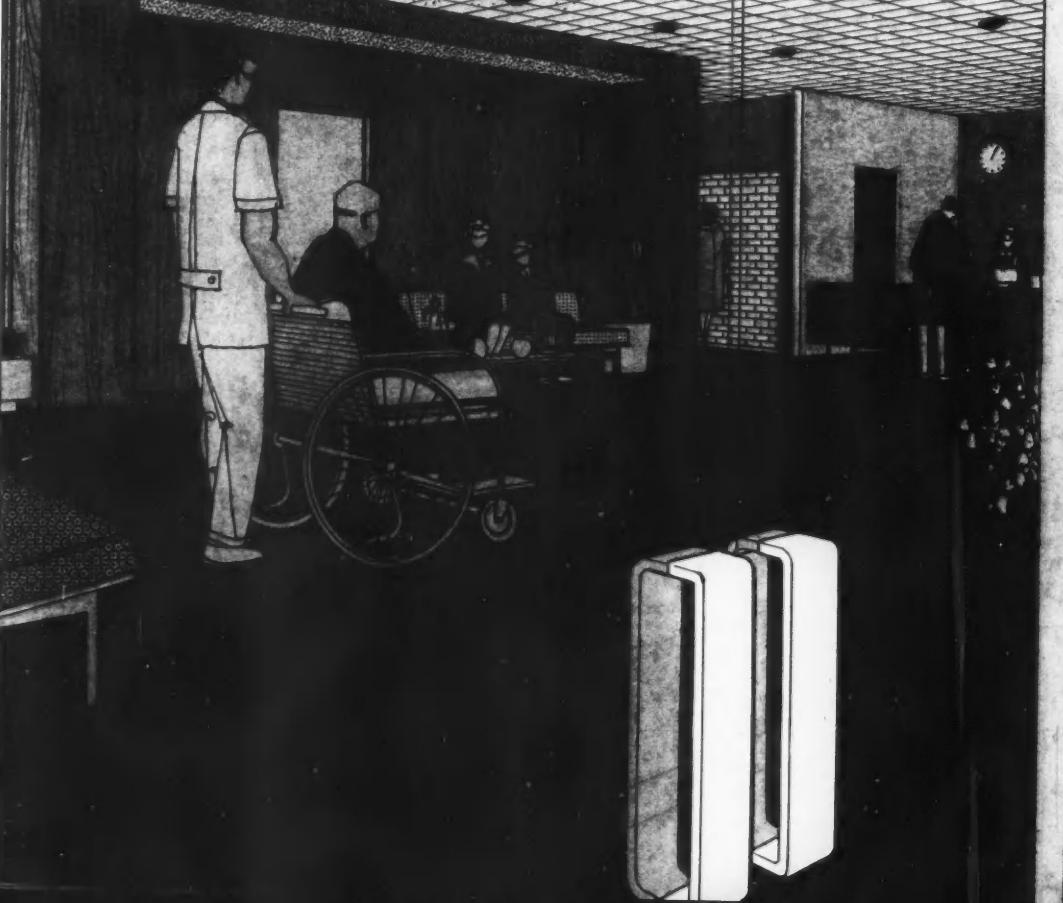
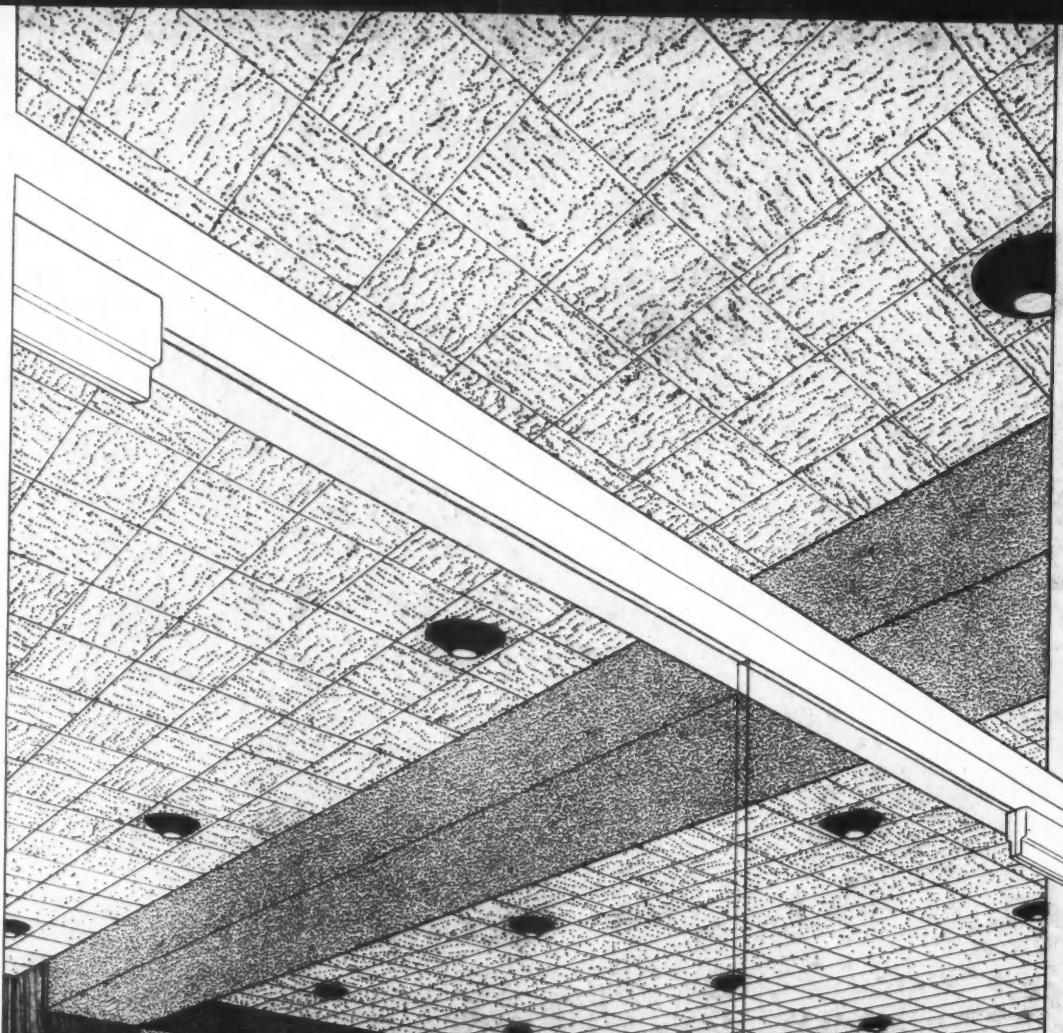
You bet I'm interested in cutting operating costs.  
Please send full details on Ozalid whiteprinters.

Name \_\_\_\_\_

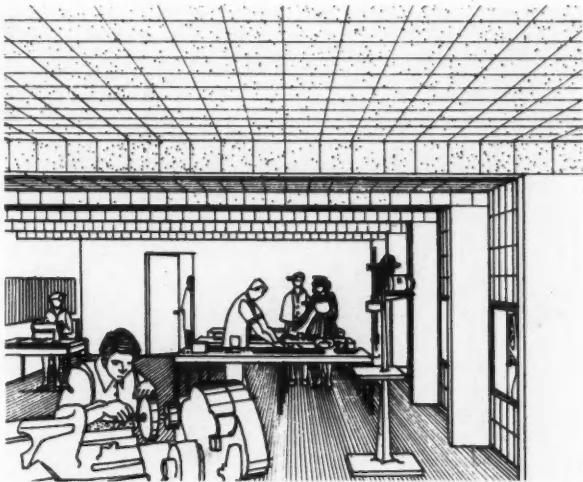
Firm \_\_\_\_\_

Address \_\_\_\_\_

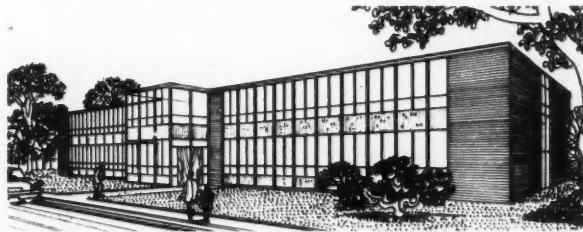
City \_\_\_\_\_



# 4-Hour Fire Code met by Armstrong Acoustical Fire Guard Ceiling in Rehabilitation Center



Excellent fire protection was the prime reason the architects specified Armstrong Acoustical Fire Guard for this Treatment Building. Installed on a TDR Suspension System, this dense mineral-wool tile combines with the floor assembly to provide a 4-hour rating as required by the federal building code. Its noise reduction qualities are also of great value, as in the occupational therapy room above.



Adult Center Treatment Building, Crotched Mountain Foundation, Greenfield, N. H. Architects: Clinch, Crimp, Brown & Fisher, Boston, Mass. General Contractor: Caron Construction Co., Manchester, N. H. Acoustical Contractor: Kesseli & Morse Co., Worcester, Mass.

Entrance lobby at left.

## Armstrong ACOUSTICAL CEILINGS

*First in fire-retardant acoustical ceilings.*

**TECHNICAL DATA: U. L. RATED:** Armstrong Acoustical Fire Guard offers one- to four-hour rated fire protection for structural components. **SAVES MONEY, CONSTRUCTION TIME:** Up to 30¢ per sq. ft. by eliminating intermediate fire protection; often earns lower insurance rates; up to two months' time through dry installation. **SUSPENSION SYSTEMS:** For tile: TDR, Zee; for new Lay-In units (24" x 24" x 5 8" and 24" x 48" x 5 8"): Fire Guard grid system. **CHOICE OF DESIGNS:** Fissured (shown), Classic, Full Random. For full information, call your Acoustical Contractor, your Armstrong District Office, or write Armstrong Cork Co., 4209 Rock Street, Lancaster, Pa.

Renderings by Helmut Jacoby

# NEWS '62



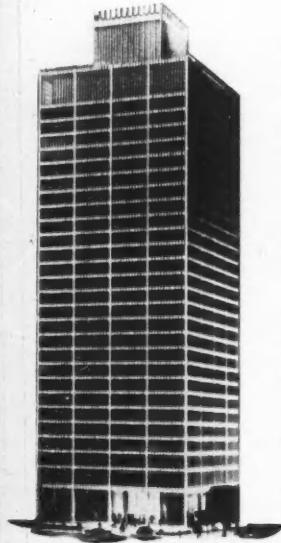
## THE ULTRA-CIVILIZED INTERCOM— EXECUTONE'S NEW 'SILHOUETTE'

Here's an intercom with all the qualities you'd want in a confidential secretary: good looks . . . perfect manners . . . pleasant speech . . . discretion . . . and a fresh approach to time-saving, cost-cutting efficiency. For example: This compact, fully transistorized instrument gives you clear channels to key people. It lets you call any department—even while you're on the phone—and brings an instant response. It frees phones and switchboard for important outside calls. And it has unique courtesy features. Calls are announced by chime signal at executive and staff locations. Incoming voice volume is automatically maintained at modulated level. These and other electronic advances make this intercom as pleasant as it is practical. Smart, too, the Silhouette unclenches the "profit squeeze" by paying for itself in dozens of ways, including savings on your telephone bills. Why wait? Write for full details and informative 14 page booklet.

Dept. H-3, 415 Lexington Avenue, New York 17, N. Y.

**Executone**

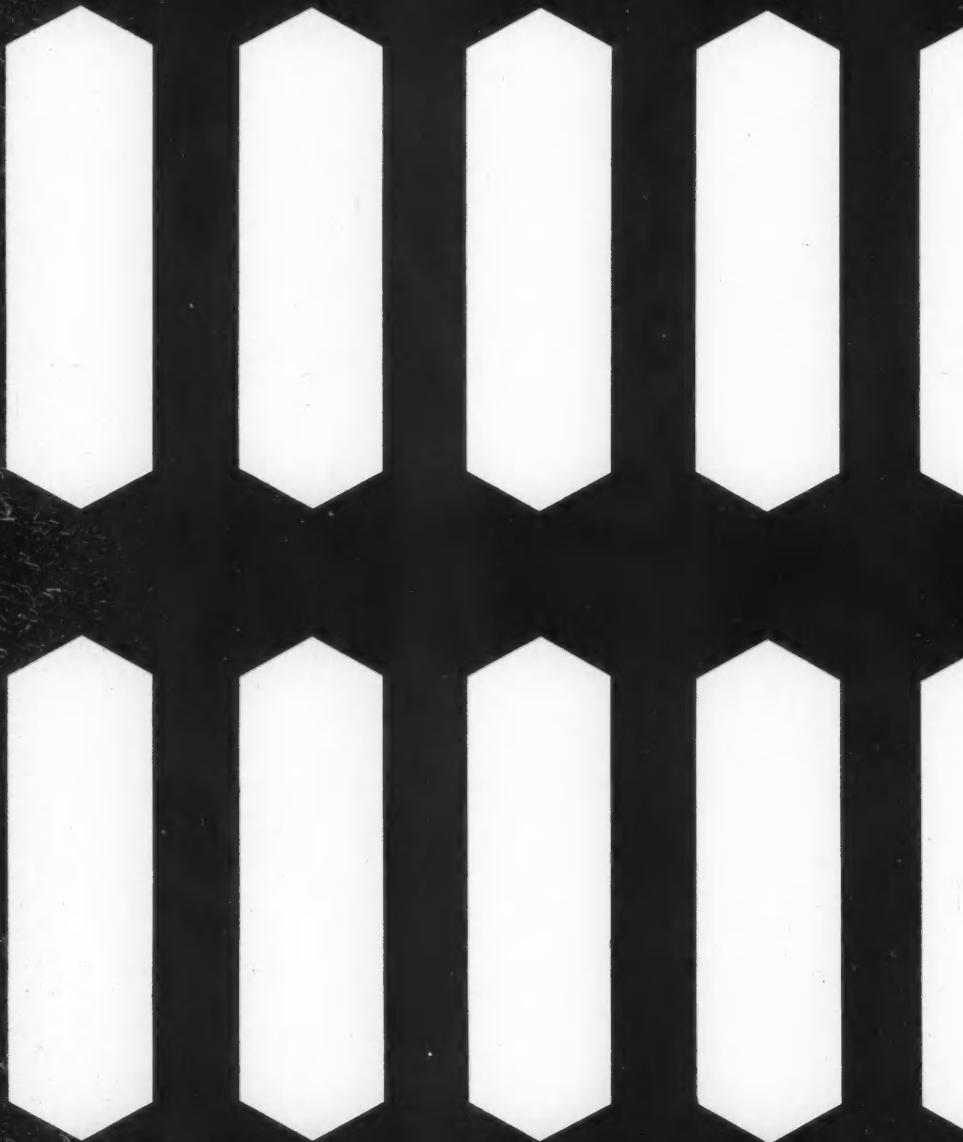




Many said it was impossible to build these windows of stainless steel—and meet the architect's requirements for design and quality. Then Adlake made not one, but a series of important

## technical breakthroughs

As described on the next page, each window has 2 welds instead of 6, and ingenious clamps that keep weather-seal and glazing strip compressed, windows anchored. Why not let ADLAKE translate your creative ideas into reality?



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Necessary  
If Mailed in the  
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BUSINESS REPLY MAIL

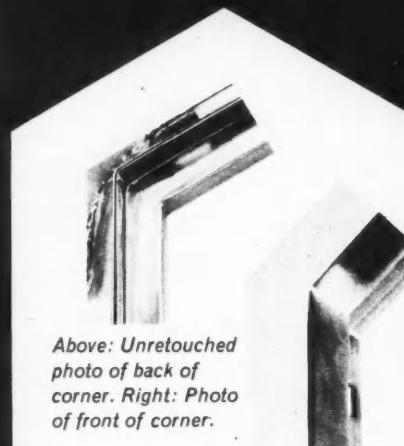
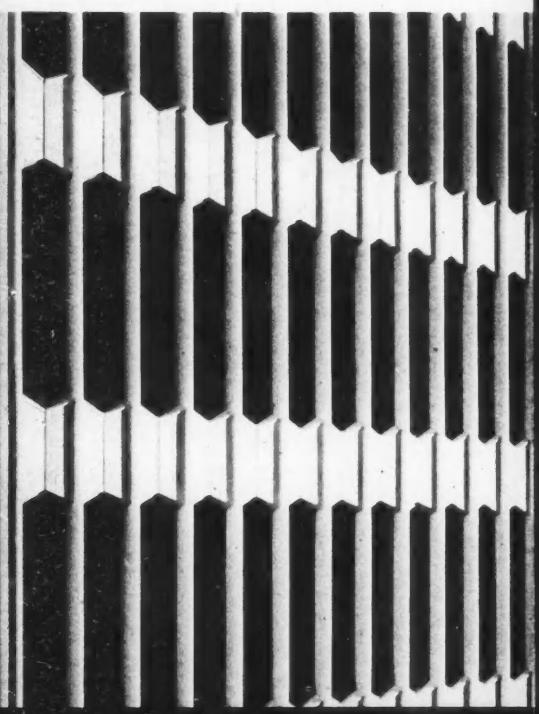
First Class Permit No. 537 Elkhart, Indiana

BUILDING PRODUCTS DIVISION  
DEPT. 47

THE ADAMS & WESTLAKE COMPANY  
ELKHART, INDIANA

Postage  
Will be Paid  
by  
Addressee

32-story Michigan Consolidated Gas Company building in Detroit. Associated Architects & Engineers: Minoru Yamasaki—Smith, Hinchman & Grylls. General Contractor: Bryant & Detweiler. Windows by The Adams & Westlake Company, Elkhart, Indiana.



Above: Unre touched  
photo of back of  
corner. Right: Photo  
of front of corner.

## MAIL CARD BELOW

Gentlemen: Please send me my copy of **ADLAKE REPORTS ON A  
TECHNICAL BREAKTHROUGH** by return mail.

NAME

TITLE

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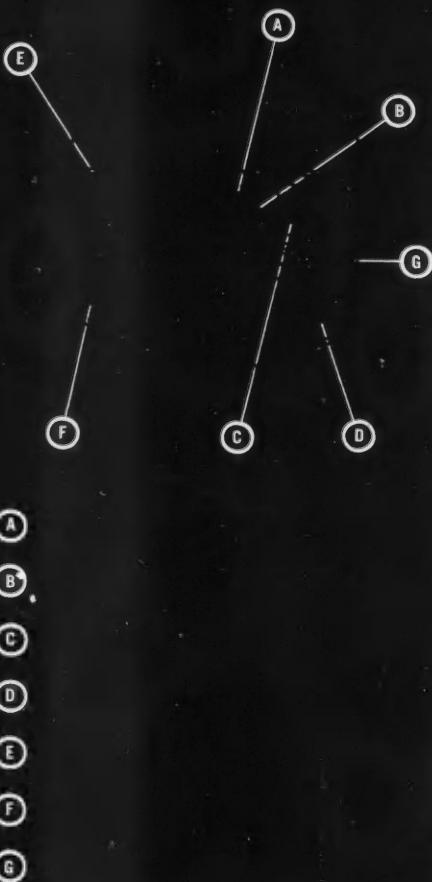
ADDRESS

Please send me the name and address of my nearest Adlake representative.

I would like an Adlake representative to call.

Others might have made this stainless steel window by welding six individual rails together. Cost would have been high. So would the possibility of human error in welding. The Adlake way was to produce the window from two rolled sections that were *bent instead of cut*. Machine welds at only two places! Production costs, low. Quality high. Human error at nil! But, this achievement consists of more than bending a pair of stainless steel rails to an ordinarily impossible angle. Equally revolutionary is the clamp—which compresses the weatherseal and glazing strip to exactly the required degree automatically. Again, no chance of human error. These clamps also anchor the windows to the building (no screws to be applied) and hold the interior trim. Thus, installation time is cut and replacement of glass—if necessary—can be made in minutes.

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**A+**  
**Adlake®**

WINDOWS AND  
CURTAIN WALLS  
OF STAINLESS  
STEEL



# Good *Exhaust* Ventilation Is Needed in Every Home!

Be sure of good exhaust ventilation, which will do all six of these important things, if you select rated and certified ventilating fans — ventilating fans which will move air in accordance with their ratings.

The fans manufactured by members of the Home Ventilating Institute are rated and certified — and will ventilate in accordance with these ratings.

All fans are tested at an outstanding independent University Laboratory — and the results are Certified. Only in this way can you be assured of air movement that will provide the benefits every new and modernized home should enjoy — the benefits of good exhaust ventilation.

Look for these "H. V. I." Labels on the ventilating products you buy — and be sure!

Send for new illustrated "HOME VENTILATION GUIDE"

Home Ventilating Institute, 1108 Standard Bldg., Cleveland 13, Ohio

## GOOD EXHAUST VENTILATION WILL —

- 1 Remove cooking odors from the kitchen.
- 2 Take grease and moisture from the air.
- 3 Get rid of excess cooking heat.
- 4 Keep walls and cabinets clean.
- 5 Remove bathroom odors and moisture.
- 6 Replace stale air with fresh, clean air.



Exhaust Fan Tag



Exhaust Fan Label



Hood Fan Label

## MEMBERSHIP LIST

BERNS AIR KING CORP.	NUTONE, INC.
BROAN MFG. CO. INC.	PROGRESS MFG. CO.
EMERSON-PRYNE CO.	ROBERTS MFG. CO.
FASCO INDUSTRIES, INC.	SWANSON, INC.
MIAMI-CAREY MFG. CO.	TRADE-WIND DIVISION, ROBBINS & MYERS, INC.

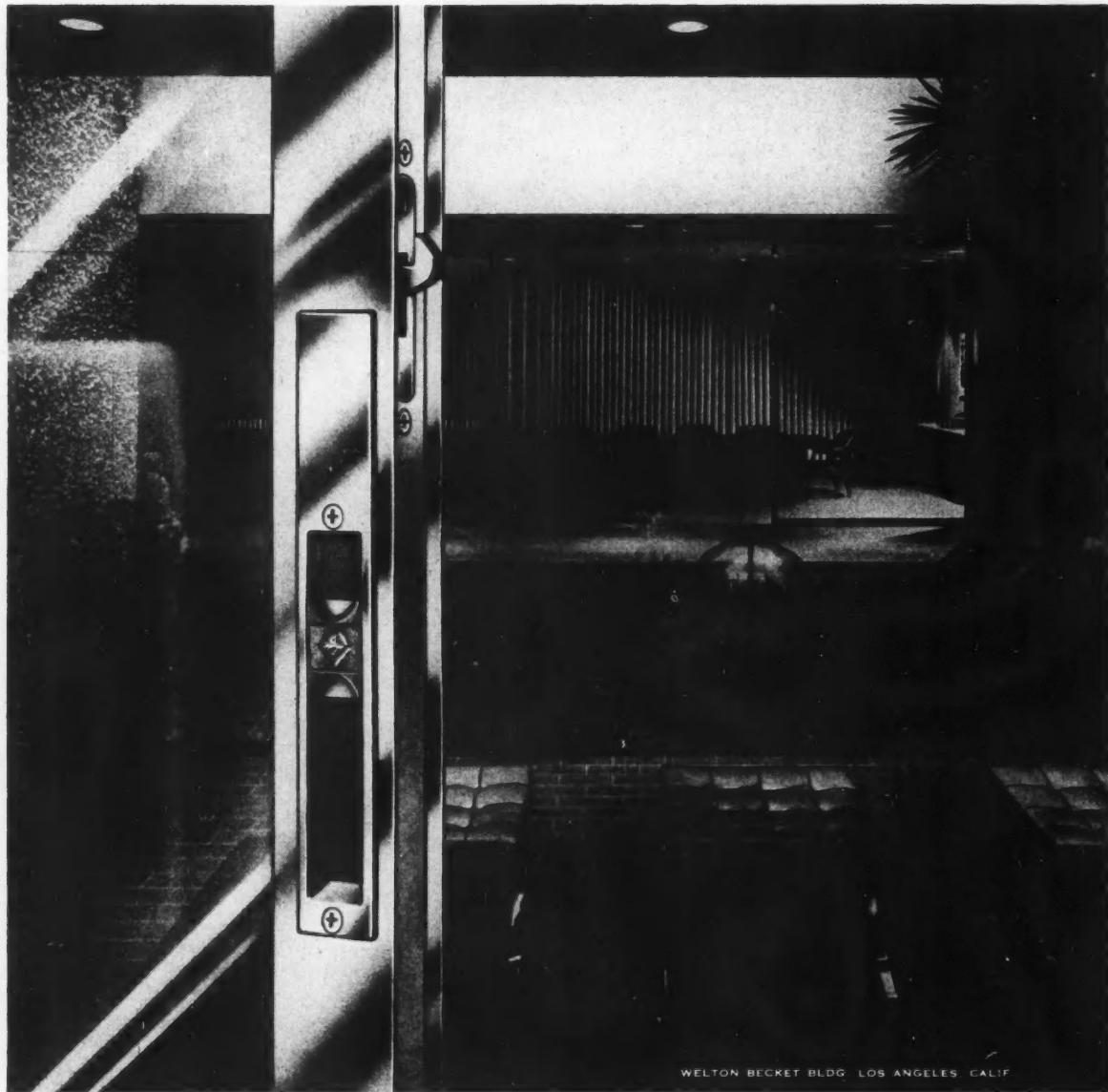
*You Can Be Sure If You  
Select an "HVI" Certified Fan*



TESSERA/ARMSTRONG VINYL FLOORS



SEE YOUR ARMSTRONG ARCHITECT-BUILDER CONSULTANT



WELTON BECKET BLDG. LOS ANGELES, CALIF.

## CRISP LINES, CLEAR VIEW, COMMON SENSE FLUSH MOUNTED LOCKING UNITS FOR SLIDING GLASS DOORS

The wide acceptance of the sliding glass door results from its visual depth and spaciousness. Hardware which impairs the view or prevents the door from fully opening defeats the purpose. The Adams Rite 4189 and 4190 flush mounted locksets are the first to offer unobtrusive beauty and freedom of movement for these doors. Screens can be by-passed, doors can be "stacked" in pockets, and inside drapes or blinds will not be torn by catching on surface hardware.

The pull escutcheons are designed to accent the narrow vertical lines of the aluminum door frame.

Deeply recessed finger pulls provide exceptional control of door movement. Slide-button operator actuates locking mechanism from inside with simple up or down movement. Key control is provided on 4190 unit by 5-pin cylinder lock in outside escutcheon.

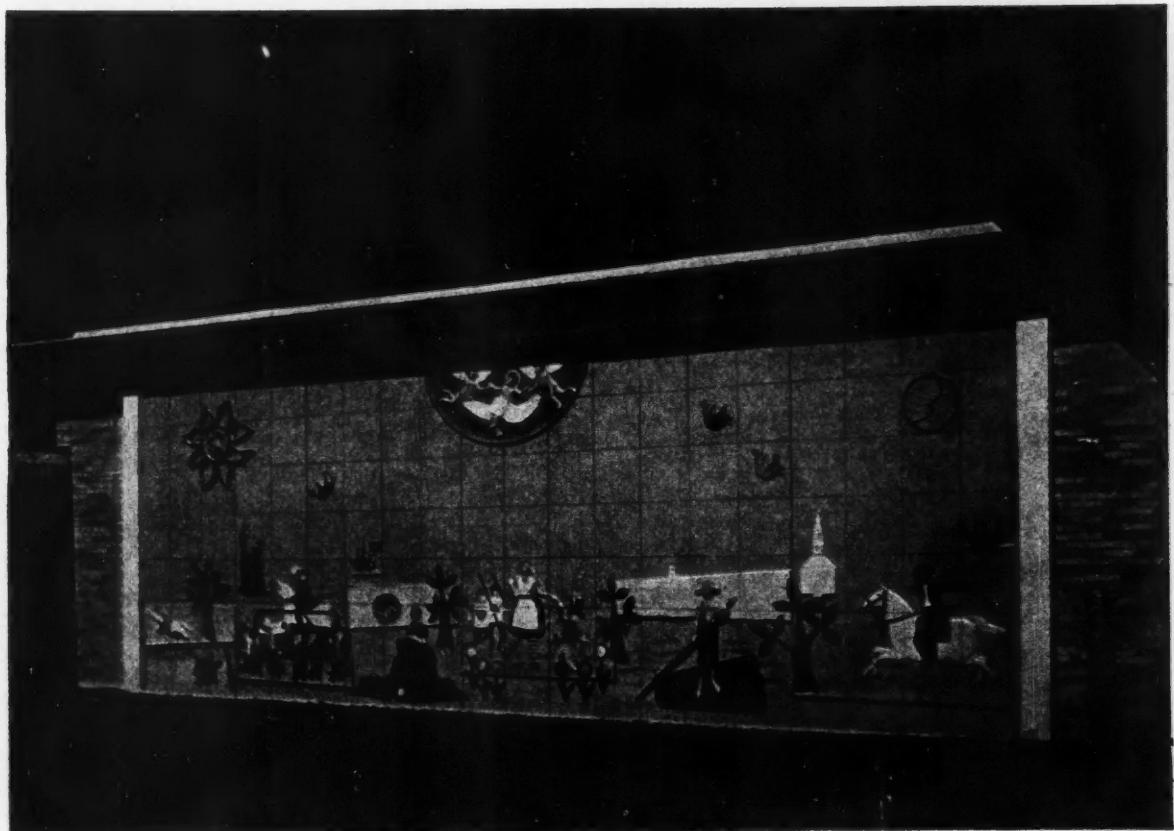


WRITE TODAY For Complete  
Details and New Catalog

**ADAMS RITE**  
MANUFACTURING COMPANY  
340 West Chevy Chase Drive, Glendale 4, California



**LOCKPORT ELEMENTARY SCHOOL, LOCKPORT, LOUISIANA. Fernand Picou—Architect. J. B. Talley & Co.—Builder. Polychrome mural panel of Ceramic Veneer depicts nursery rhyme characters in many gay colors. Panel is 14' high by 39' wide. Size of the Ceramic Veneer units is 24" x 23½".**



## **Every creative design can be faithfully reproduced in Ceramic Veneer**

With Ceramic Veneer you can design freely, imaginatively . . . and create in lasting color. You can select delicate tints or dominant hues, monochrome facings or polychrome panels . . . smooth, roughened or tooled textures . . . paneled, fluted or scored forms. You have a choice of ornamental sculpture or bas-relief, intricate trim or repetitive patterns. Just as the buildings on your boards are custom-designed to the project, so too is Ceramic Veneer custom-made to your plans . . . in units large or small, for interiors or exteriors. Moreover, this time-proved building material is moderate in price, economical to install, easy to keep clean. For complete information including new solar screen and color guide brochures, write us today. Without charge we will gladly furnish construction detail, data, advice and estimates on preliminary sketches involving the use of Ceramic Veneer.



**FEDERAL SEABOARD TERRA COTTA CORPORATION**

10 East 40th Street, New York 16, N. Y.

■ Plant at Perth Amboy, N. J.



ONE-HAND OPERATION is easy with lightweight JAMOLITE. Door above is light blue, harmonizing with blue ceramic wall tile and red floor tile.



COOLER AND FREEZER DOORS. Reluctant lobster is conveyed through JAMOLITE cooler door toward freezer door. Jamison Frostop® on freezer door prevents icing and freezing shut.

brighter,

lighter

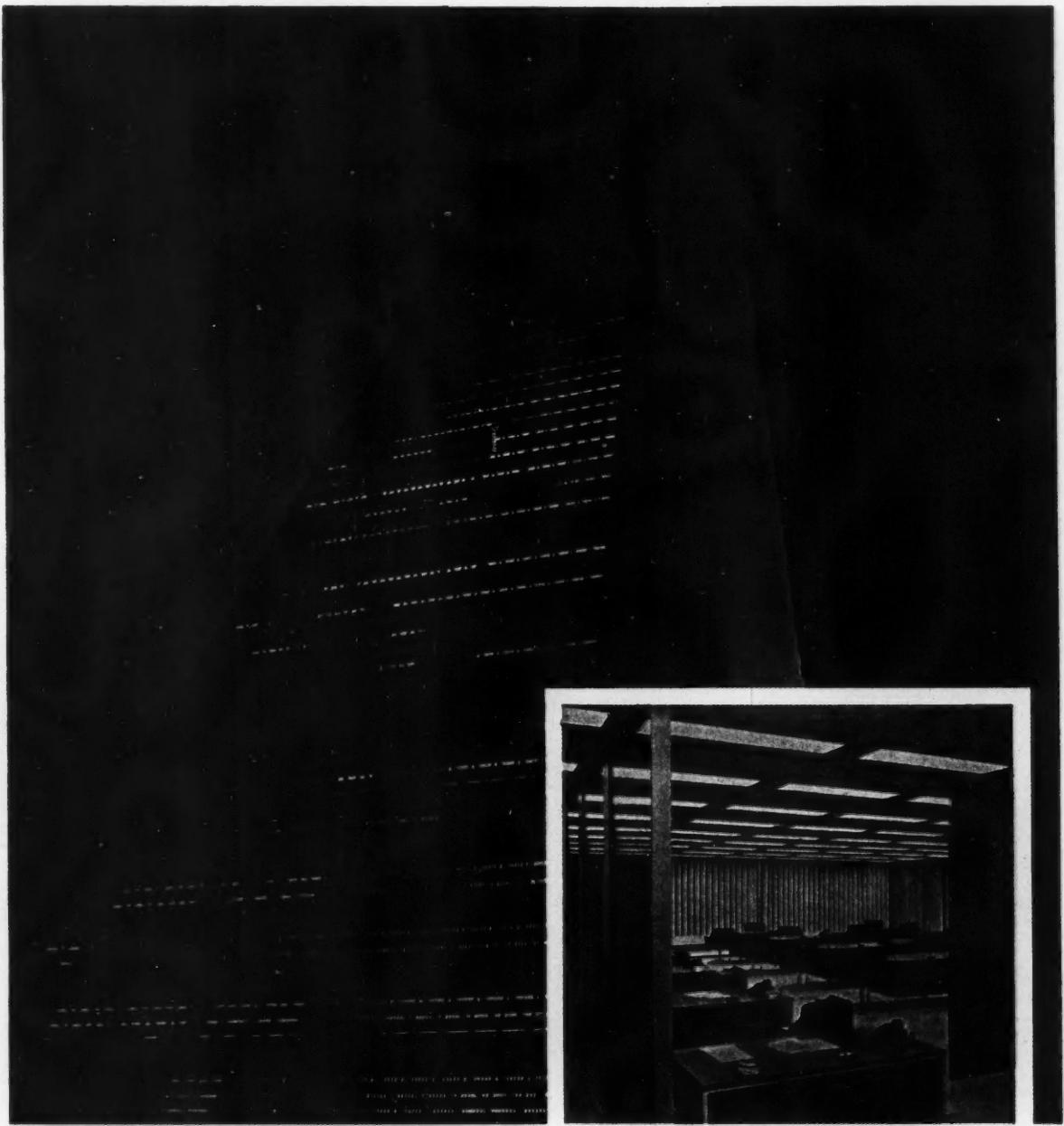
**JAMOLITE® Doors**  
at the new quarters  
of The Summit Club

- In the beautiful Barclay Building on the City Line Gold Coast in Bala-Cynwyd, across from Philadelphia, Pa., Jamison Jamolite Doors are providing bright new color and easy operation in both cooler and freezer rooms. Jamolite doors are all plastic and weigh only 1/5 as much as thick metal clad doors. They are flush-fitting, easy to clean, and their hard, bright surface resists staining and discoloration.

Today in hotels, restaurants, cafeterias, institutions and other food-service installations, these attractive doors are the leading specification. Jamolite doors are available in white, salmon, ivory, blue-green and light blue. Insulation is foamed-in-place polyurethane plastic, 4" thick.

Write today for complete details on Jamolite Doors to Jamison Cold Storage Door Co., Hagerstown, Md. Ask for Catalog 7.

**JAMISON**  
COLD STORAGE DOORS



Architects: Skidmore, Owings & Merrill

## *Lighting* for prestige buildings— **Plexiglas**

There are 40,000 fluorescent luminaires, each equipped with a lens molded of crystal-clear PLEXIGLAS® acrylic plastic, at the new Chase Manhattan Bank building in New York—a landmark on the downtown skyline and a milestone in architectural planning.

The PLEXIGLAS lenses are precisely designed optical elements that assure full utilization of light. They are strong and rigid, yet light in weight... will remain free of discoloration after years of exposure to fluorescent light. The result: another example of a magnificent building that uses PLEXIGLAS to obtain lighting of the highest quality.

We will be pleased to send you literature on PLEXIGLAS.

as a lighting material, and the names of manufacturers whose equipment includes PLEXIGLAS lenses and diffusers... for lighting that stands out and stands up.

**ROHM & HAAS**

PHILADELPHIA 5, PA.



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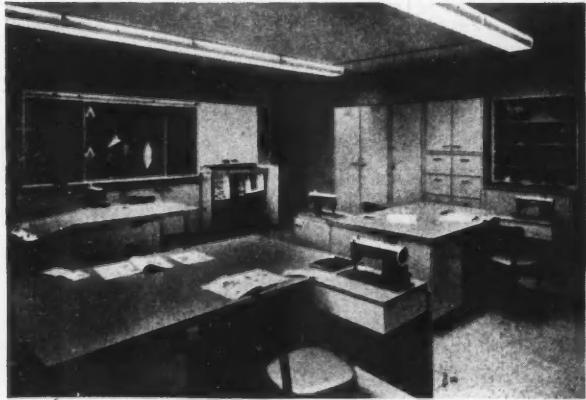
teaching  
is easier...  
learning  
is fun



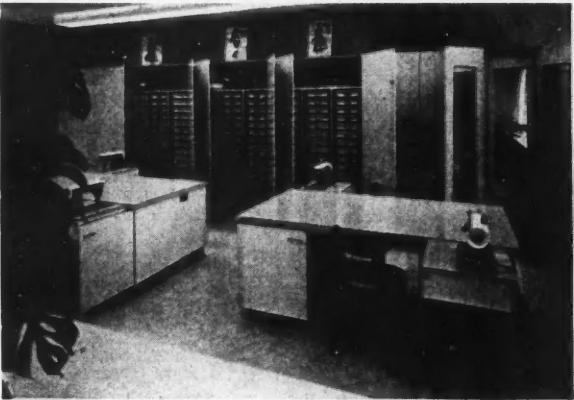
FOODS

*in custom-designed classrooms by St. Charles*

Deerfield High School, Deerfield, Ill. • Architects: Loeb, Schlossman & Bennett, Chicago • St. Charles Representative: I. P. Rieger Co., Bellwood, Ill.



CLOTHING



CLOTHING

Both teacher and pupils work so much better in a St. Charles *custom-designed* school installation. That's because beauty and durability are built into every piece of St. Charles equipment along with the quality that brings long-range economy. And, of course, St. Charles *flexibility* means that each installation meets the individual teaching need. If you're planning new classrooms — or remodeling old ones, check to see how much more you get with St. Charles — the ultimate in quality school equipment.

Write for free catalog: "St. Charles Custom School Storage Furniture." Available at request on your letterhead, St. Charles Manufacturing Co., Dept. ARS-11, St. Charles, Ill.



*St. Charles*  
CUSTOM SCHOOL STORAGE FURNITURE

School Storage Furniture for Food, Clothing, Science Labs • Arts & Crafts • Elementary Classrooms



## Alcoa V-Beam solves architect's predicament to taxpayers' delight

Good looks, strength, budget price, next-to-nothing maintenance: What a predicament the architect faced in covering these school walkways. He resolved it, much to the taxpayers' delight, with Alcoa® Aluminum V-Beam Roofing.

Low in cost and light in weight, Alcoa V-Beam goes up quickly and economically. Natural aluminum, handsomely stucco-patterned, never needs finishing whatever the climate. No yearly item in a maintenance budget is Alcoa V-Beam Roofing. Install it and forget it!

Tax dollars go *further* with Alcoa Aluminum building products. Planning construction? Call in Alcoa early! Phone your nearest Alcoa sales office, or write today: Aluminum Company of America, 1821-L Alcoa Building, Pittsburgh 19, Pa.

**BUILDING:** Seminole High School, Sanford, Fla.

**ARCHITECT:** John A. Burton IV, AIA, Sanford, Fla.

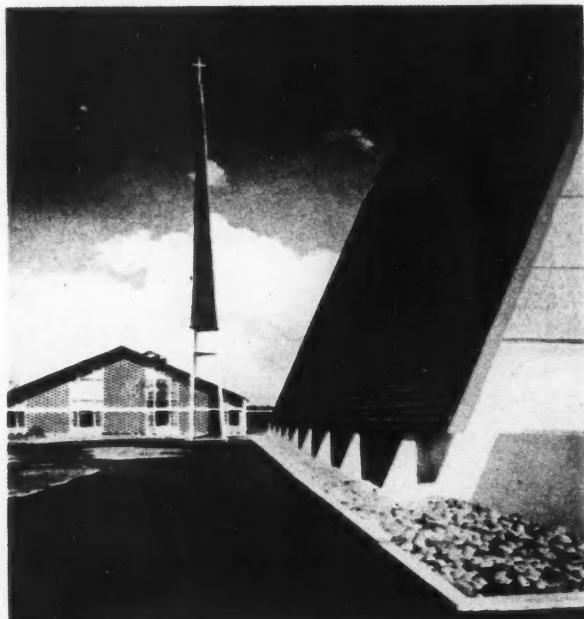
**ALUMINUM SUBCONTRACTOR:** Evans Roofing & Heating Co., Sanford, Fla.

**ALCOA ALUMINUM**  
THE ARCHITECT'S METAL

Entertainment at Its Best... **ALCOA PREMIERE**  
with Fred Astaire as Host... Tuesday Evenings, ABC-TV

# Required Reading

Concordia Senior College, Eero Saarinen, architect  
—from *Architecture Today & Tomorrow*



## Modern Architecture To Date

**ARCHITECTURE TODAY & TOMORROW.** By Cranston Jones. McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 36. 243 pp., illus. \$17.50.

As the title indicates, Mr. Jones has tried to catch modern architecture on the wing. Such an effort requires not so much a scholarly critic as a sensitive journalist, and this is journalism in the best sense—fair, comprehensible, and colorful without being yellow. The layman should find it interesting, and the architect should certainly not find it boring. In his introduction, Mr. Jones declares that "architecture is the great adventure of our time," and in the course of his exposition makes this statement seem no less than the truth.

The organization does not follow a pattern of "schools" and "trends," but rather of the accumulation of the work of individual architects. Part One comprises the undoubtedly "Form Givers" of the modern movement (Sullivan, Wright, Perret, Corbusier, Gropius, Mies and Aalto), and Part Three the engineering geniuses (Maillart, Torroja, Candela, Nervi and Fuller).

Part Two is entitled "Modern in Transition." It ranges from Neutra through Rudolph, from Breuer through Kahn, and covers, indeed,

virtually every "name" in the roster of modern American architects (Tange and Niemeyer are the only non-Americans covered). The "transition" of the subtitle is clearly not meant to mean a transition to the structural orientation of the last section. Mr. Jones describes it only in vague terms of "experimentation," "vitality," "emerging cities" and indications of a general optimism that it is leading somewhere. It is doubtful whether a scholarly critic, looking at the assembled evidence, could make a more detailed prognosis.

## Wright Biographized

**FRANK LLOYD WRIGHT.** By Finis Farr. Charles Scribner's Sons, 595 Fifth Ave., New York 17. 293 pp., illus. \$5.95.

Published initially, in abbreviated form, in *The Saturday Evening Post*, Mr. Farr's sympathetic biography is, as a popular biography should be, more anecdotal than critical. Some space is naturally devoted to Wright's architectural philosophy, and major buildings are duly recorded in terms of critical acceptance and historical place. But Mr. Farr is more interested in people than in buildings, and thinks of commissions in terms of clients. This is fair enough;

Wright's early clients were rather remarkable, and in addition to according Wright both their faith and their funds, they gave him friendship and support in time of need.

Mr. Farr also takes delight in debunking some of the Wright legends; e.g., his "leaky roofs," and his "arrogance" with clients (stories of which, says Mr. Farr, only rarely come from clients, and then often as apocryphal jokes.)

With Wright's name so prominently featured on the jacket, the biography may well be, not undeservedly, a seller. But architects who have read the *Autobiography* and other writings by and about Wright will not learn much that is new.

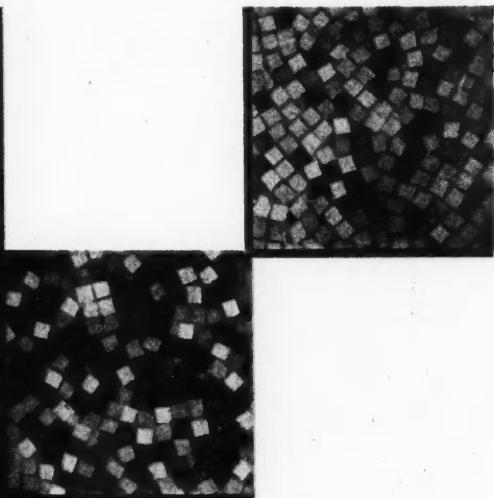
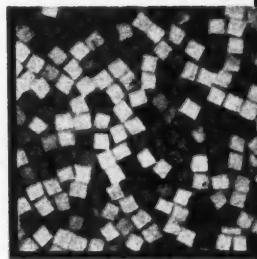
## Buildings in Two Dimensions

**PHOTOGRAPHY AND ARCHITECTURE.** By Eric de Maré. Frederick A. Praeger, Inc., 64 University Place, New York 3. 208 pp., illus. \$13.50.

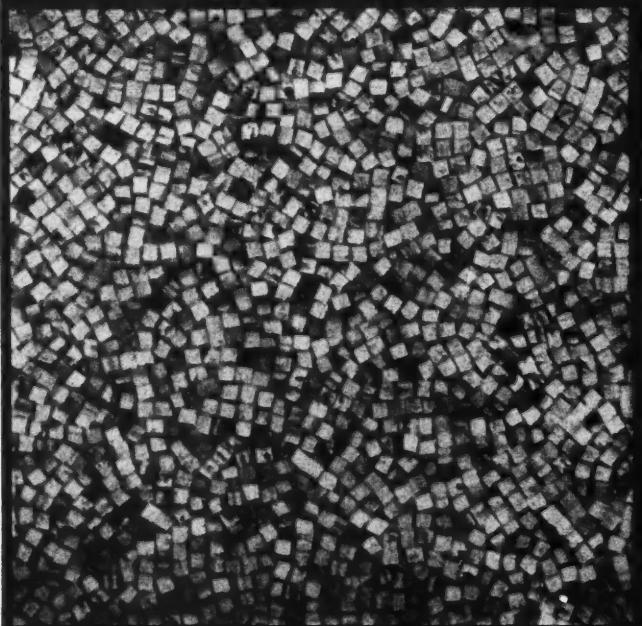
The author is both an architect and a photographer, and has divided his book into two sections: one describing his enthusiasm for the esthetic implications of photography and architecture, and the other giving how-to information. The photographs were taken by the author.

*continued on page 54*

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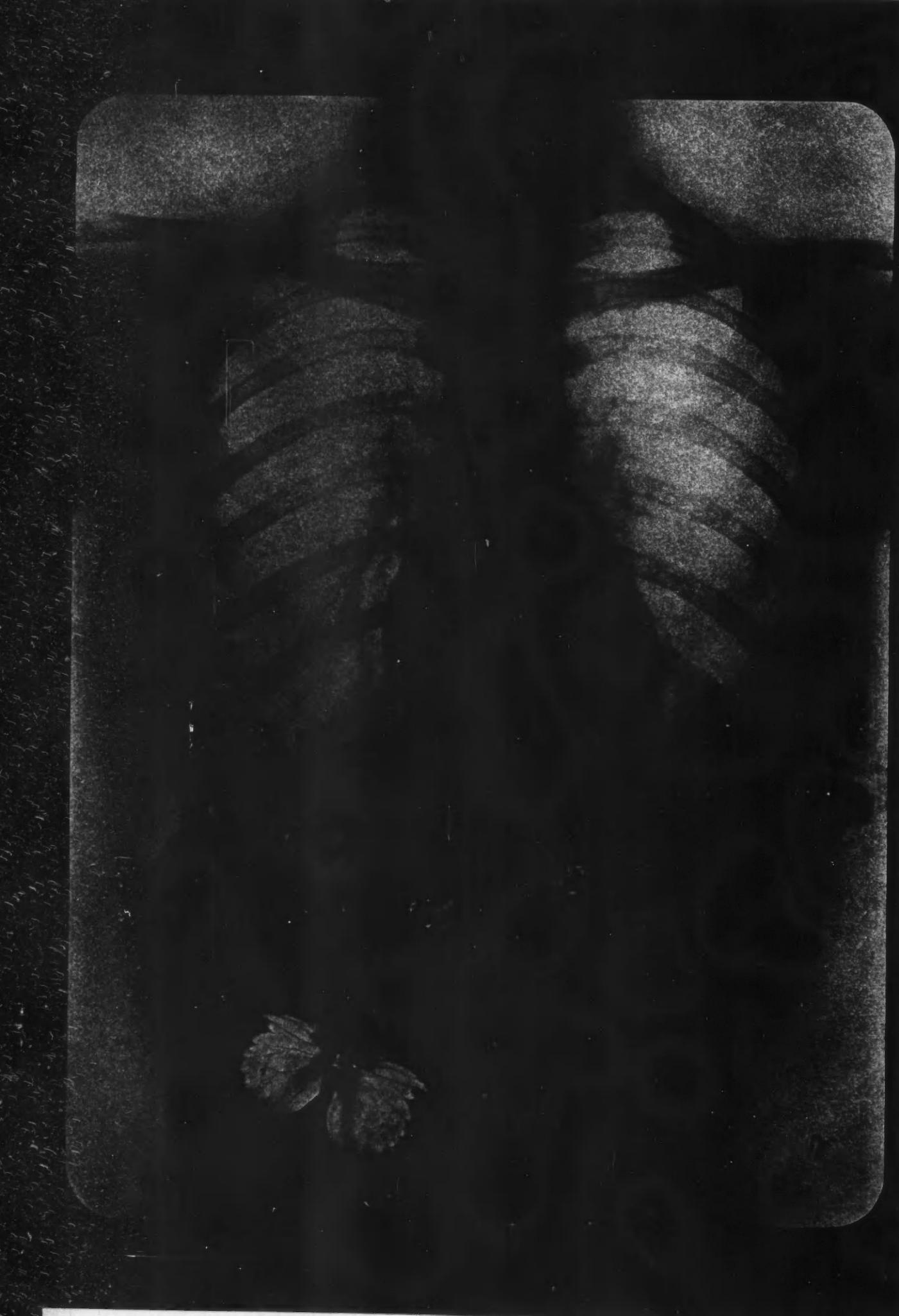


SPECIFICATIONS—Size: 9" x 9"; Thickness: .080" (standard gauge); Colors: ten.  
Feature Strips shown are: Kentile "Designer Palette" Solid Vinyl.

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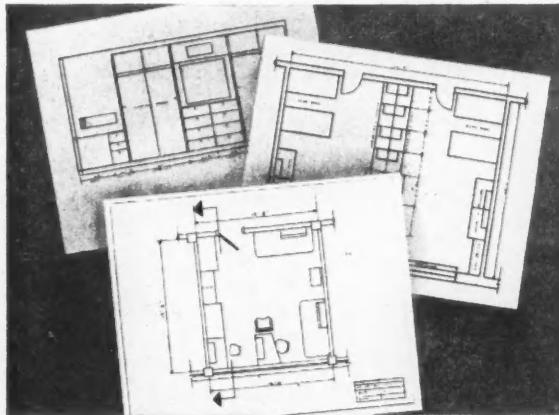
WESTINGHOUSE, ELEVATOR DIVISION, DEPT. RK02, 150 PACIFIC AVENUE, JERSEY CITY, NEW JERSEY



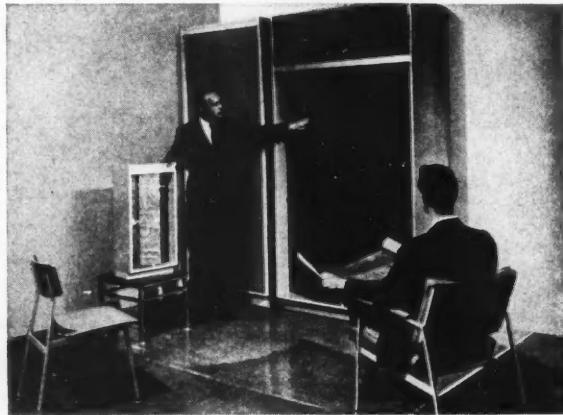
J-98802 AA

# DESIGN WITH DORM LINE

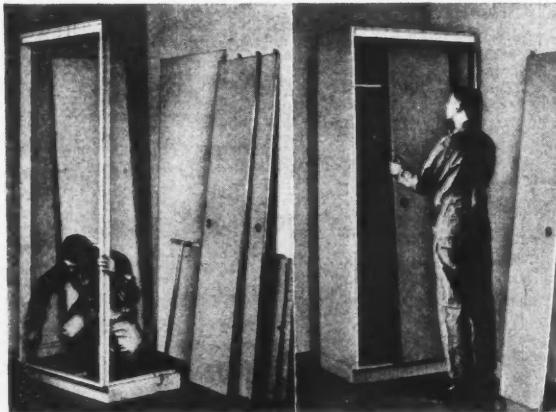
## for these economies:



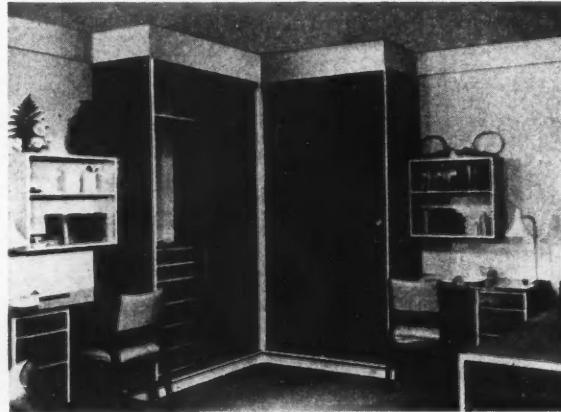
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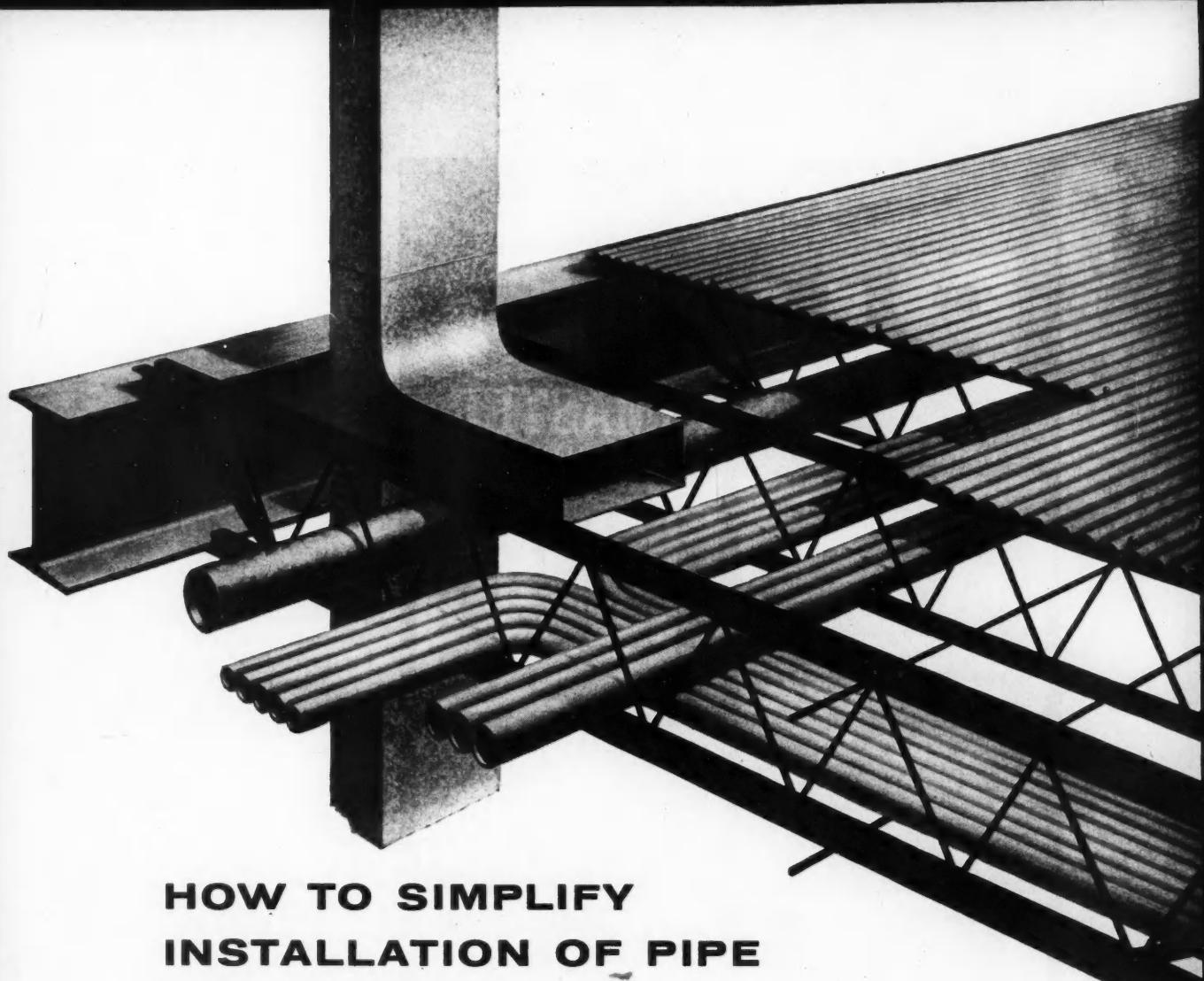
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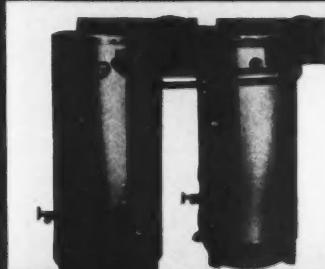
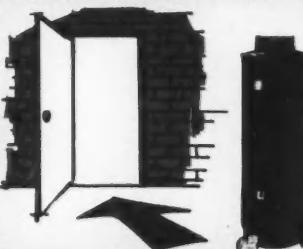
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### Required Reading

*continued from page 48*

and by other noted architectural photographers, are accompanied by captions including photographic details, and are so consistently superior as to be almost exhausting.

### Japan Yesterday

**JAPANESE HOMES AND THEIR SURROUNDINGS.** By Edward S. Morse. Dover Publications, Inc., 180 Varick St., New York 4. 372 pp. illus. \$2.

Edward Morse was a 19th century scholar who went to Japan to study the structure of paleontological brachiopods and stayed to study the structures of man. Although he was neither abjectly awed nor romantically silly about Japanese architecture, he did have a solid respect for it and, indeed, found it difficult to give it fair criticism without at the same time complaining about Western "enslavement to tawdry upholstery." And he was a wonderfully curious and observant man, recording in notes and sketches (300 of which are published here) facts about Japanese houses, gardens, interiors, amenities, structures, carpentry details, plumbings, *et al.*

Japan has changed even more rapidly than Morse was afraid it might in 1886, and the book now has little of "practical" value. But it still makes interesting historical reading, and still proves a touching tribute, in its dated way, to "that most honorable craft—the building of a house."

### Architecture Abroad

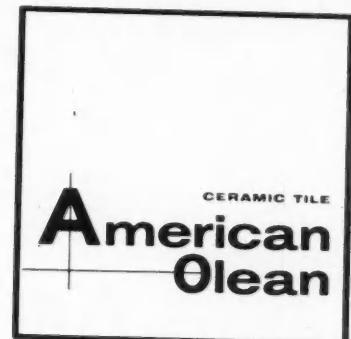
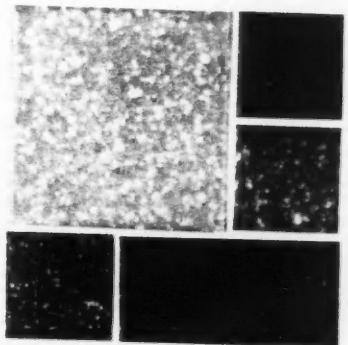
**ARCHITECTURE IN ITALY.** By Martin S. Briggs. E. P. Dutton & Co., Inc., 300 Fourth Ave., New York 10. 179 pp., illus. \$3.75.

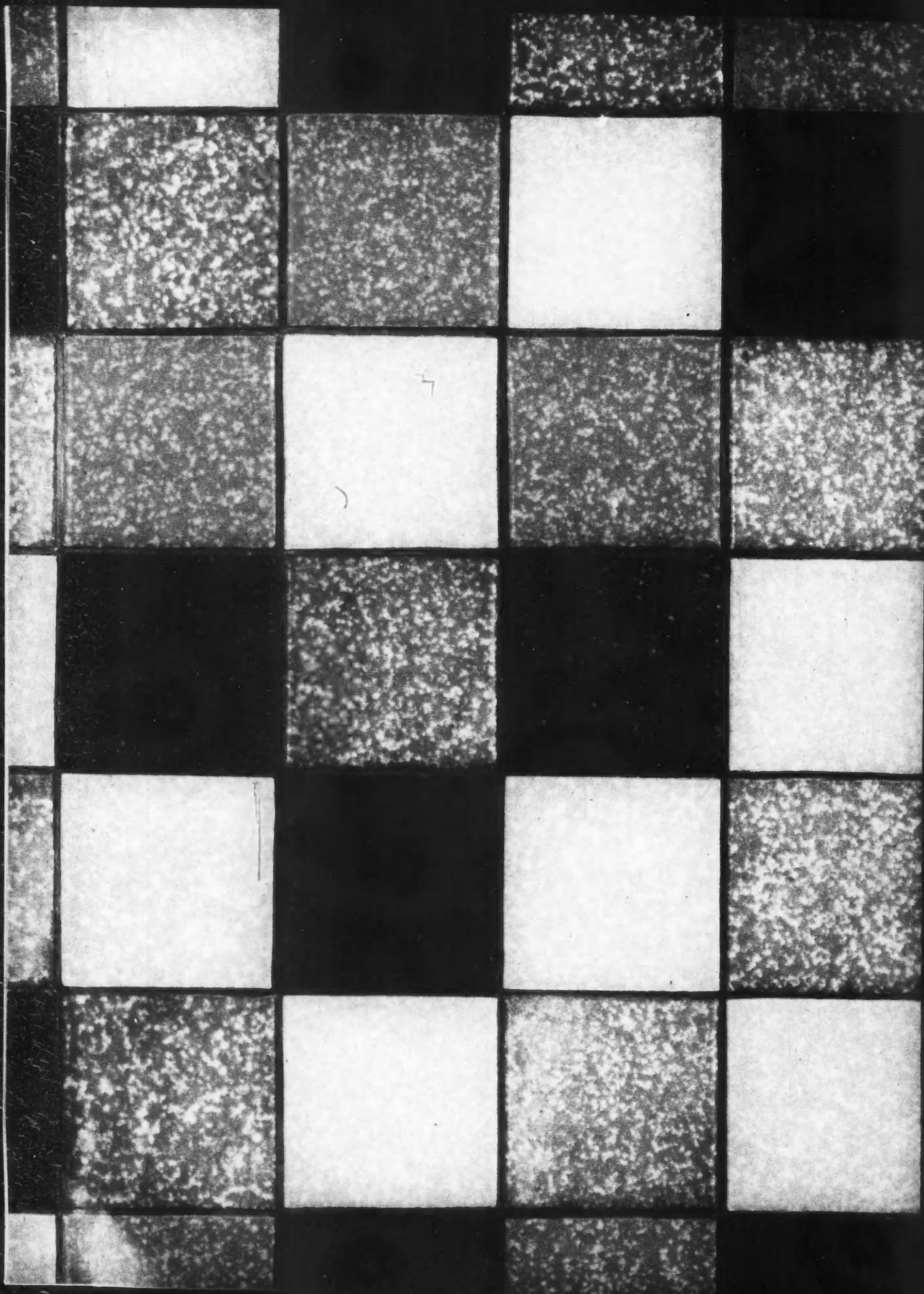
The subtitle, "A Handbook for Travellers and Students," is accurately put, since this is not, despite its convenient shape and size, a proper guidebook. The material, which is made readily comprehensible, is organized chronologically, from the Etruscans through Nervi, and is de-

*continued on page 65*

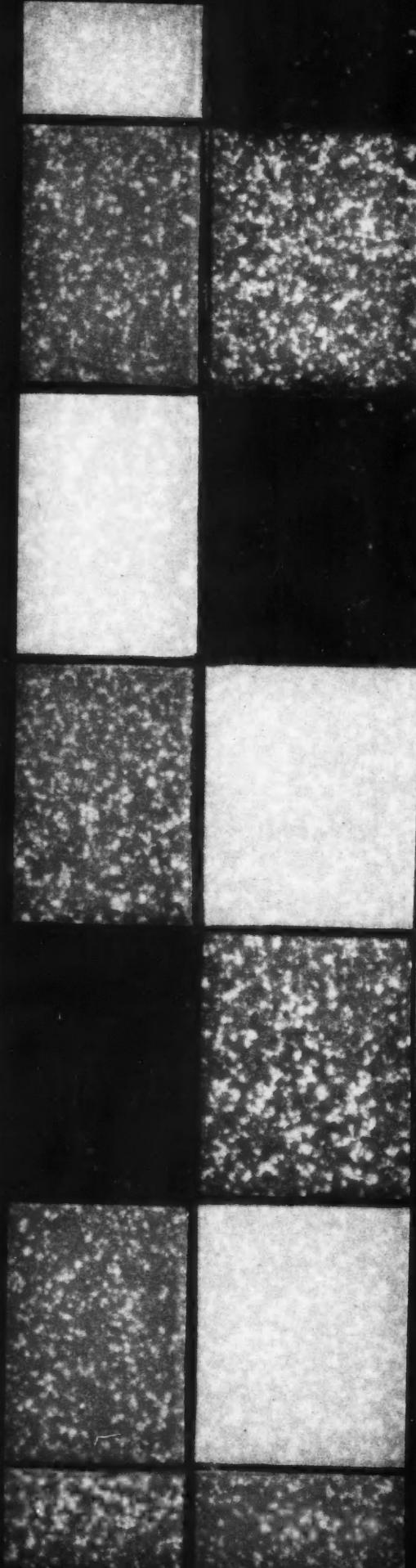
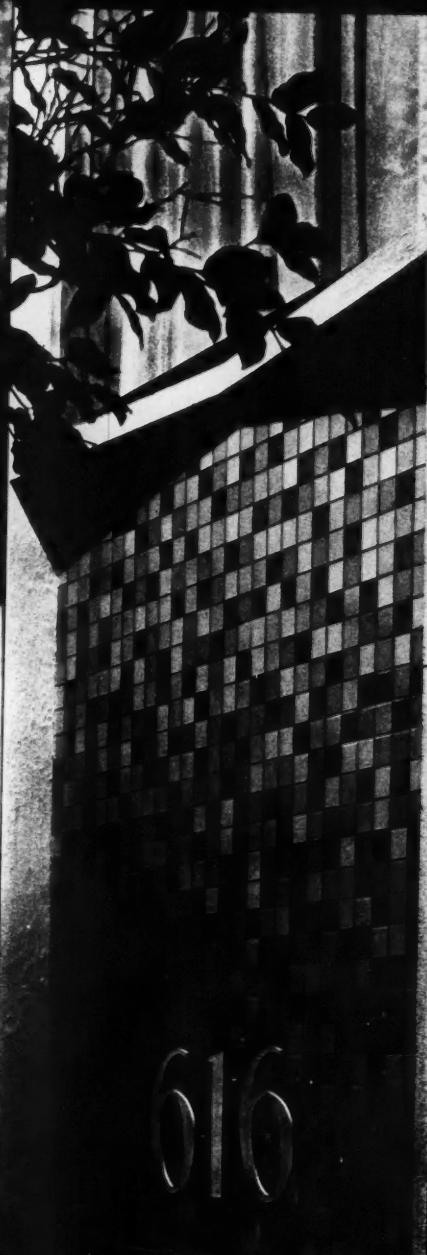
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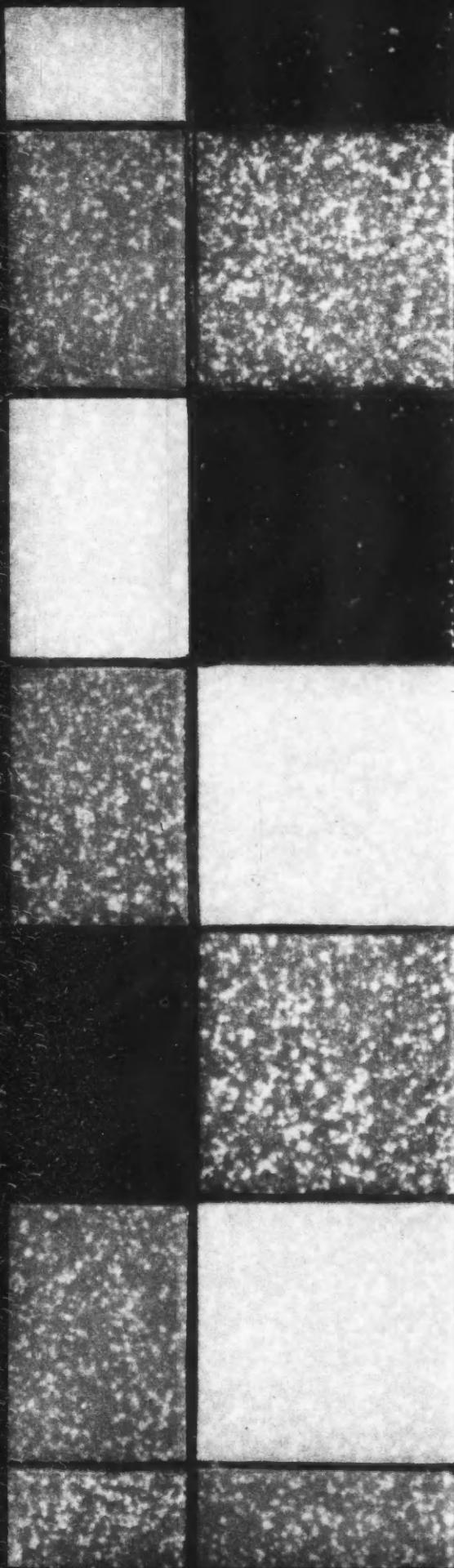




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Reproduced full size is Precedent Texline B. This same pattern is illustrated in the photo of exterior spandrel. (Plate 449)

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See next page for a few of the many new Precedent patterns.

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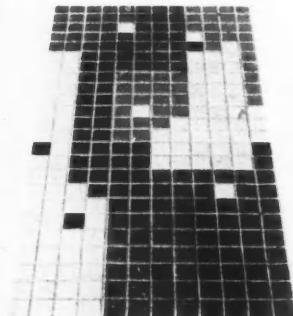
Precedent patterns.

NEW... PRECEDENT CERAMIC MOSAICS!

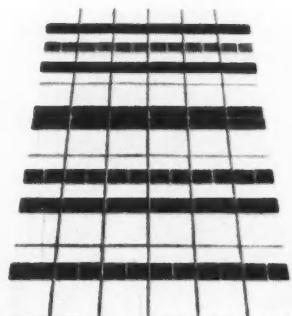


Bathroom floor is Precedent Stripe P32-2395. Wall  
Scored Design SD 5 in. x 10 in. Blue. (Plate 124)

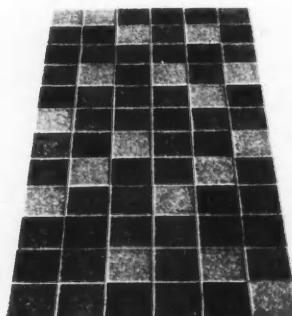
## Typical new Precedent Ceramic Mosaic Patterns selected from American Olean's new Booklet 561



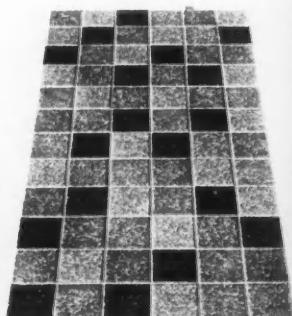
Designer Pattern P2-2424



Designer Pattern P6-2280

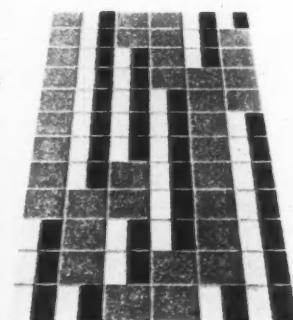


Texline Blend P14-2178

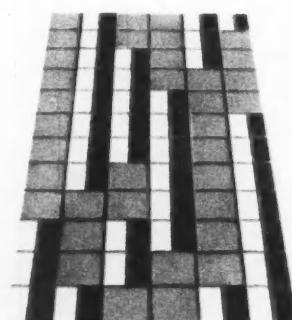


Texline Blend P20-2178

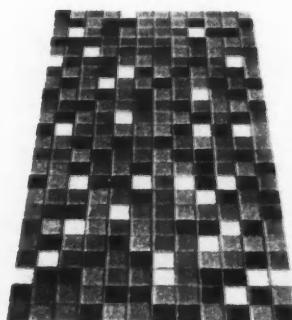
### NEW DESIGNER PATTERNS



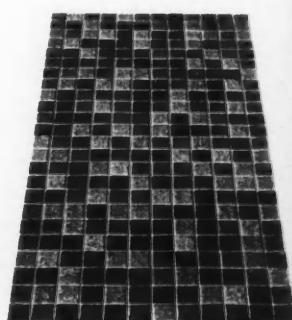
Stripe Pattern P34-2395



Stripe Pattern P35-2395



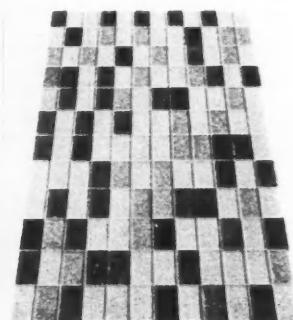
1"x1" Blend Pattern P28-2126



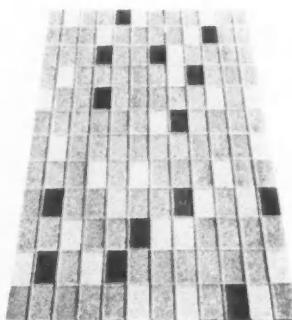
1"x1" Blend P25-2126

### NEW PRECEDENT STRIPES\*

### NEW 1 x 1 BLENDS\*



2"x1" Blend P45-3191



2"x1" Blend Pattern P50-3191



Block Random P40-7141

### NEW 2 x 1 BLENDS\*

### NEW BLOCK RANDOMS\*

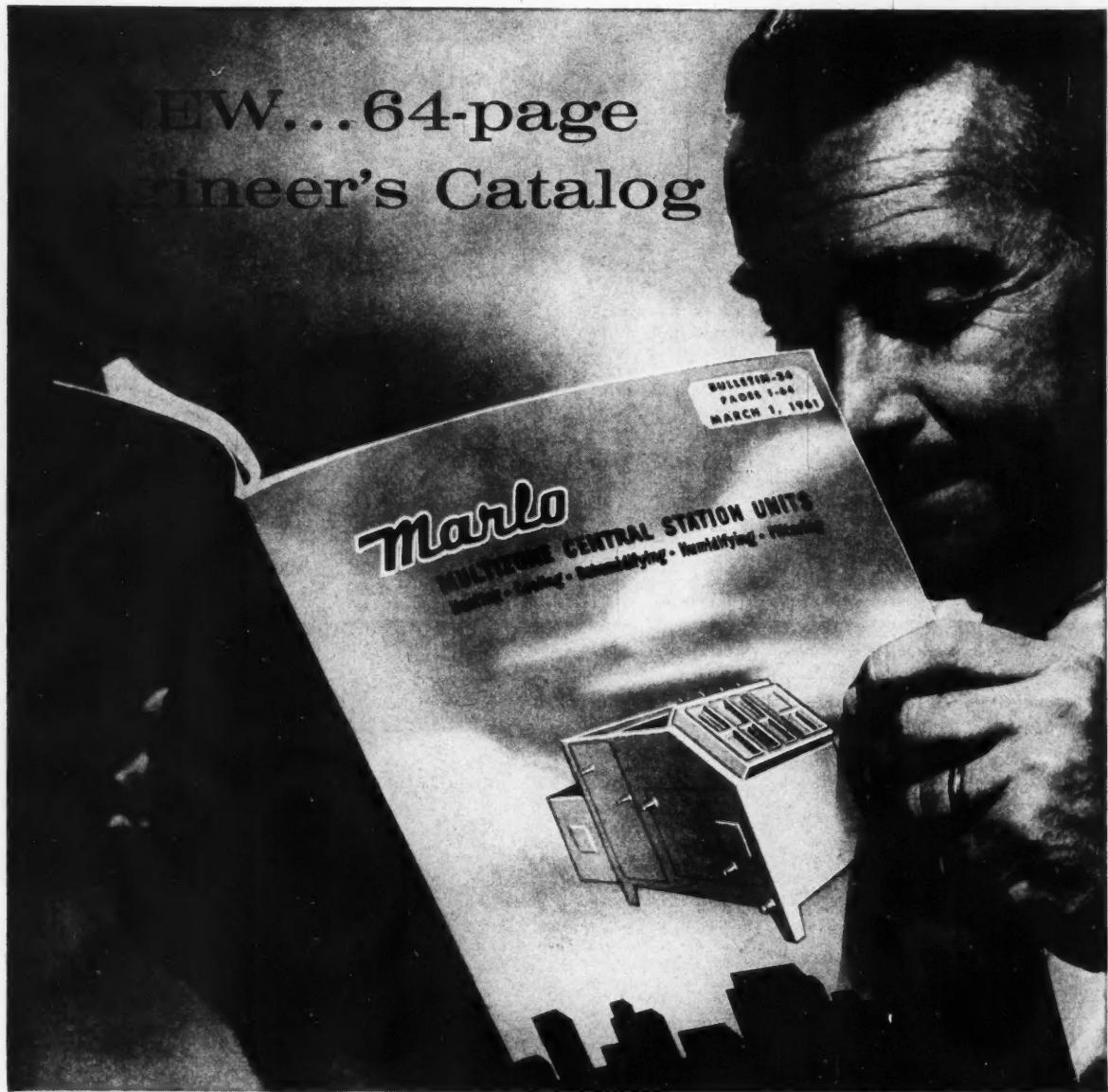
\* These patterns are maintained in stock for prompt shipment. They are designed to blend with American Olean glazed tile colors and with all leading bathroom fixture colors.

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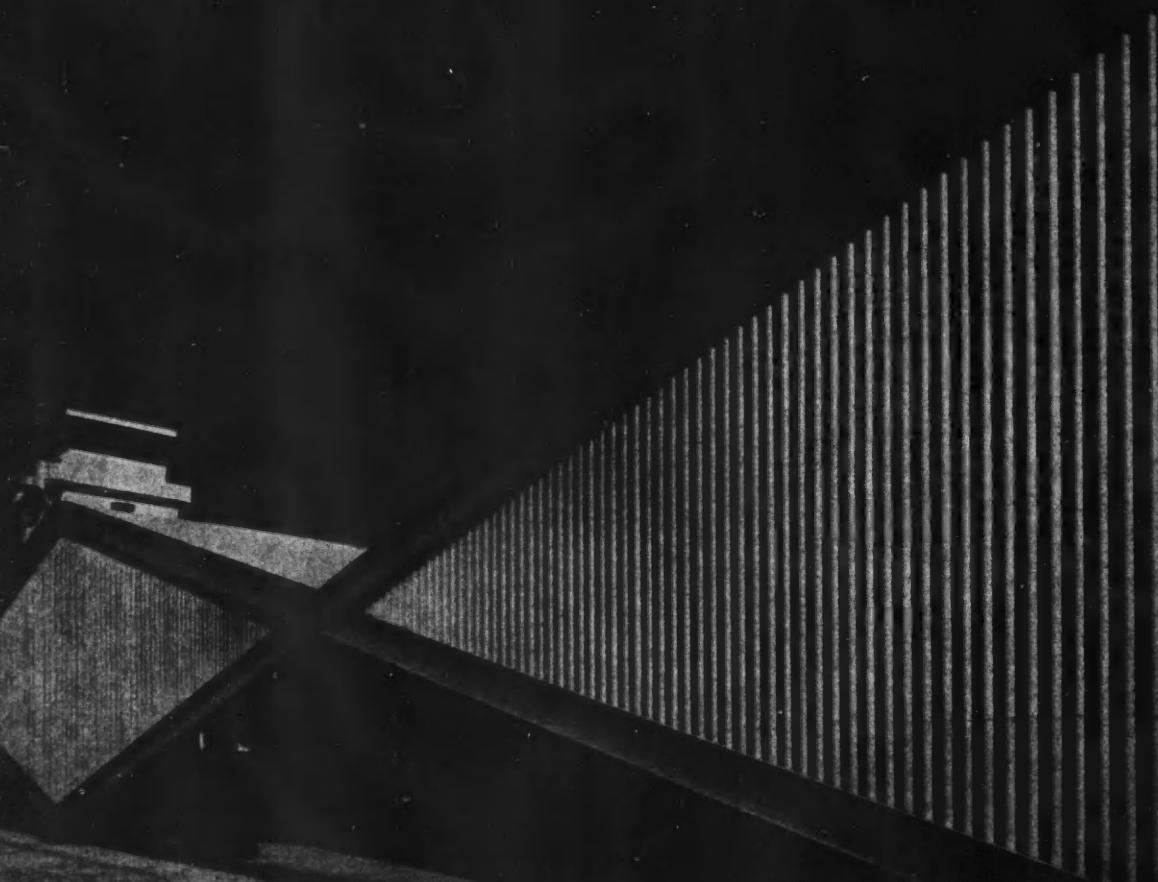
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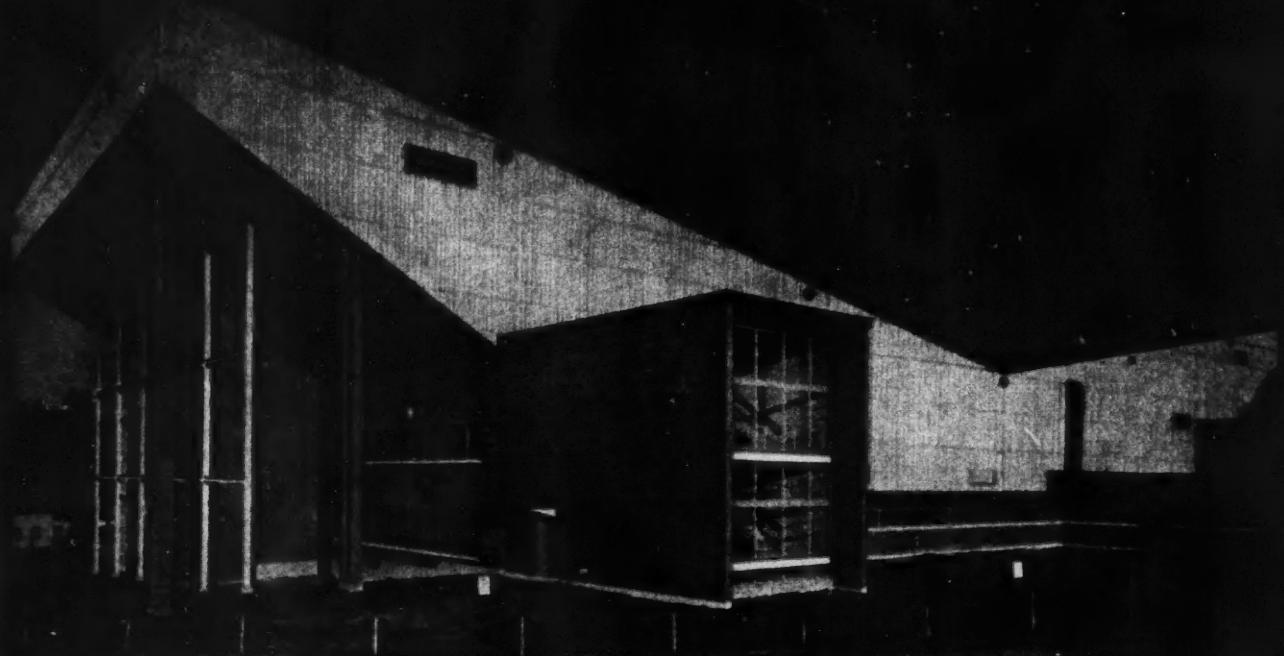
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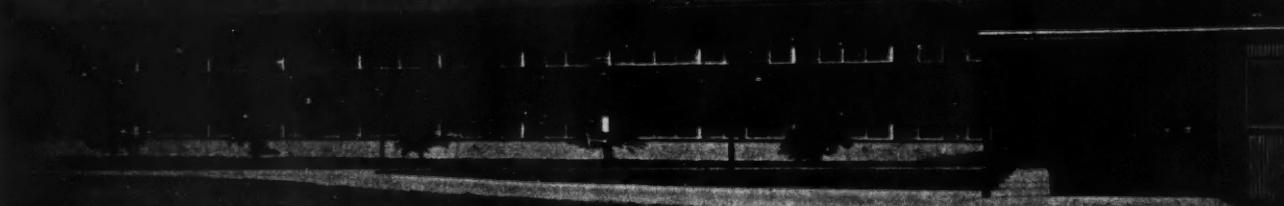
Donald J. Prout & Associates, Architects



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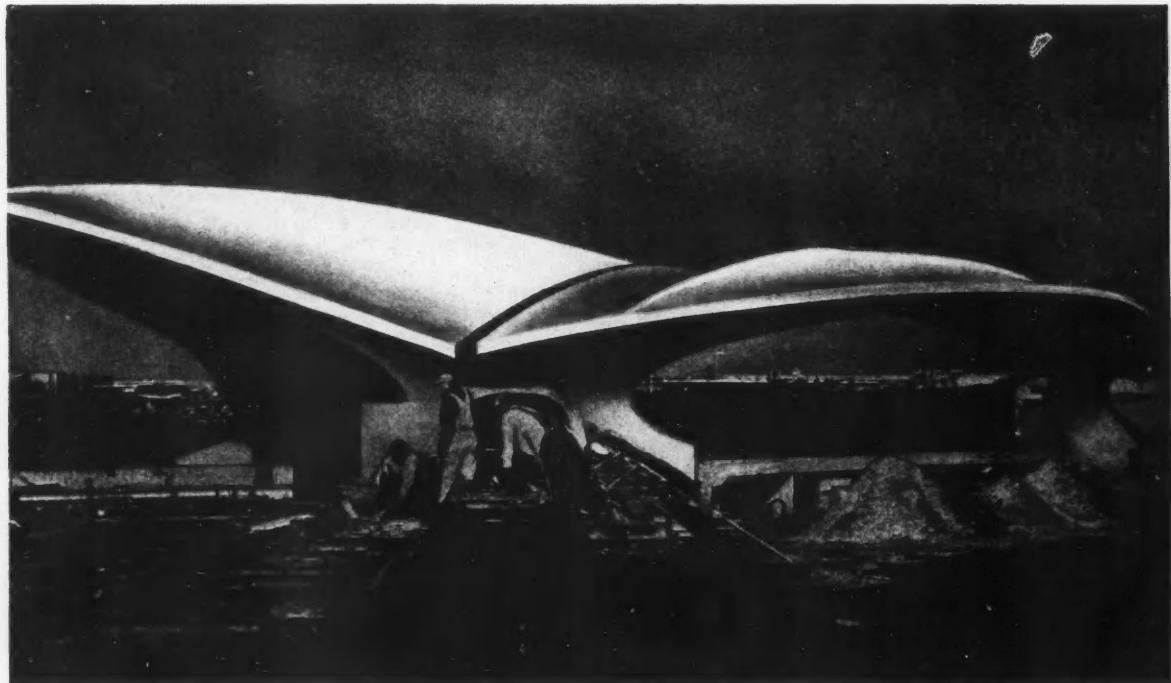
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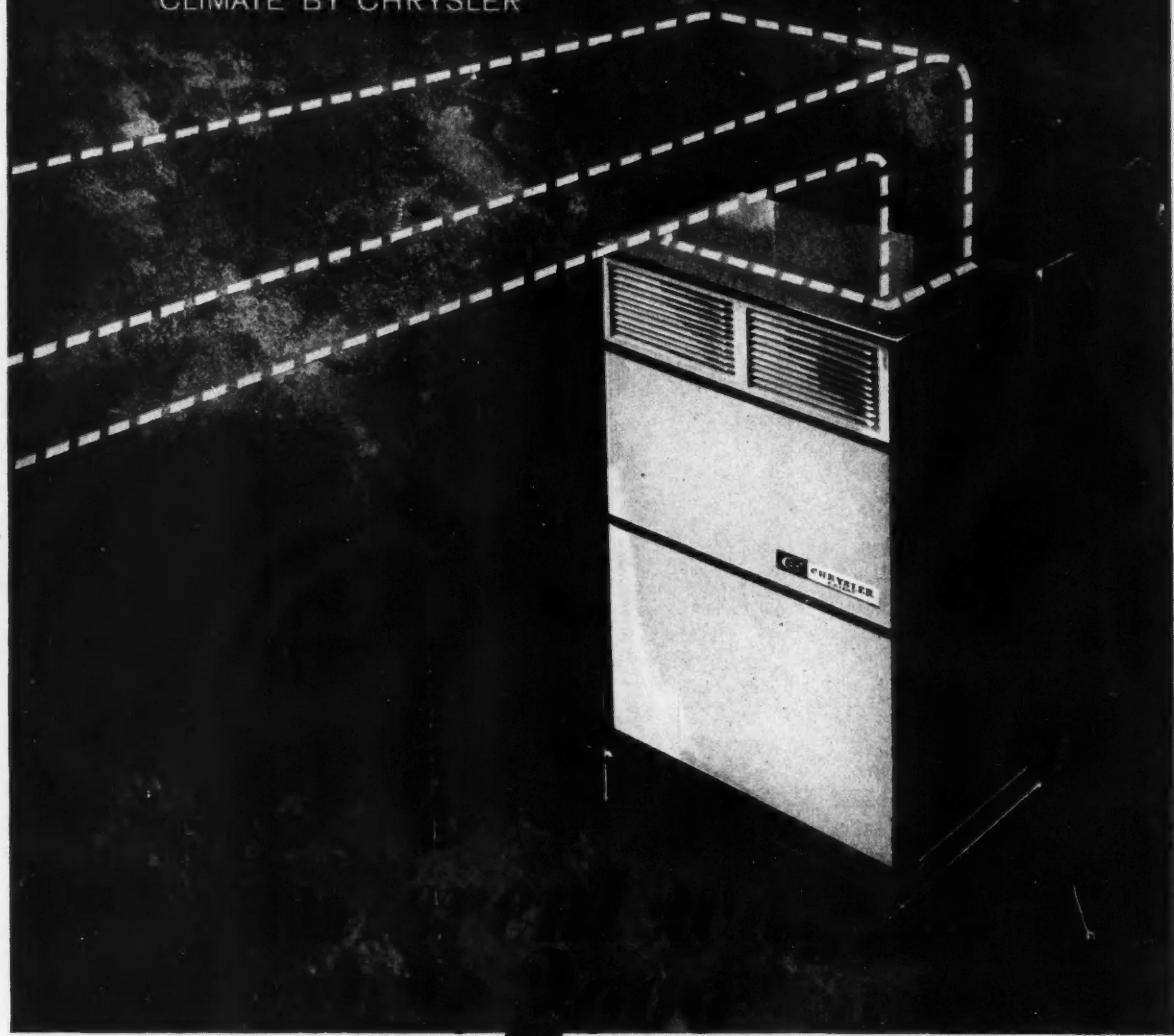
Suggestive of a huge bird poised for take-off, the new TWA Terminal Building at Idlewild Airport is a testimonial to the flexibility of this construction method. Its huge concrete shell roof is an arch cantilever design in four continuous monolithic reinforced concrete sections.

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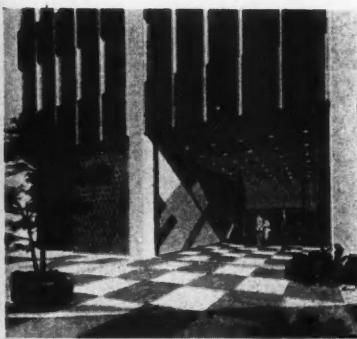
*KAHN & JACOBS*

*P.A.B.*

Design project: a commercial office building entrance. The designers: the New York architectural firm of Kahn & Jacobs. Here's another vivid reflection of architectural awareness of ceramic tile's growing role: for beautiful exterior walls, distinctive floors, colorful spandrels.

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Expressway, Dallas, Texas



## Required Reading

*continued from page 54*

signed to serve as a brief historical introduction to the "standard topographical guidebooks."

**THE ART OF CHINA: SPIRIT AND SOCIETY.** By Werner Speiser. 257 pp., illus. \$5.95. **THE ART OF INDIA: FIVE THOUSAND YEARS OF INDIAN ART.** By Herman Goetz. 275 pp., illus. \$5.95. **THE ART OF INDONESIA: THE ART OF AN ISLAND GROUP.** By Frits A. Wagner. 257 pp., illus. \$5.95. **Art of the World Series,** Crown Publishers, Inc., 419 Fourth Ave., New York 16.

It seems quite a while since publishers have brought out good books at popular prices on the exotic arts of the world. Possibly the texts are a little more scholarly than the casually interested reader would care about, but neither are they likely to leave any casual questions unanswered. All of the authors concentrate mainly on the fine and minor arts, though architecture has its innings in the coverage of India and China.

The reproductions are quite beautiful, quite generous, and virtually all in color.

#### For the Children

**THE FIRST BOOK OF ARCHITECTURE.** By Lamont Moore. Franklin Watts, Inc., 575 Lexington Ave., New York 22. 82 pp., illus. \$1.95.

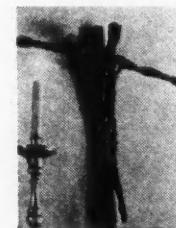
Guiding a fairly young, but literate, child through Architecture, Mr. Moore starts with the Taj Mahal (pure architecture) and ends with the Piazza San Marco (pure architecture plus). What may strike an adult as misleading oversimplification will certainly strike the child as admirable directness; and the facts, each will recognize, are accurate. Anyone contemplating giving this little book to a child ought, however, to be warned that the presentation is opened—stimulating to the child's curiosity, but demanding of the donor's knowledge (if the approach to St. Peter's is "one of the three most noted squares in the world," for instance, what are the other two?).



*The  
"American"  
in American  
Architecture*

#### ARCHITECTURE AND THE ESTHETICS OF PLENTY

By James Marston Fitch. "Does American Architecture display qualities that we can safely describe as characteristic, irrespective of whether or not we are proud of them?" The author answers the question in fascinating detail, exploring the problems, past and present, that make our architecture what it is today. A vivid analysis is presented of the paradox of plenty, the conflict between quantity and quality in American design. He concludes that our professionals are producing buildings that are "neither economical to build, comfortable to live in, nor simple to keep in operating order." 288 pages. More than 100 illustrations. \$7.50



*Can  
church art  
be both  
reverent—and  
revolutionary?*

#### MODERN SACRED ART AND THE CHURCH OF ASSY

By William S. Rubin. On January 4, 1951, in the town of Angers in France, a Canon of the Catholic Church was giving an illustrated lecture. As a slide of a crucifix (above) flashed upon the screen, suddenly the hall exploded in tumult. Voices cried, "Sacrilege!" The Church of Notre-Dame-de-Toute-Grace in Assy, France is a veritable museum of modern art—and, as a result, a storm center of controversy. Important as this controversy was to the world of art in general, this book is the first serious examination to be made of these unusual works. The author takes the reader step by step through the church itself, describing the architecture, the plan, and each controversial work of art. 256 pages, and 45 pages of illustrations—many in full color. \$8.75

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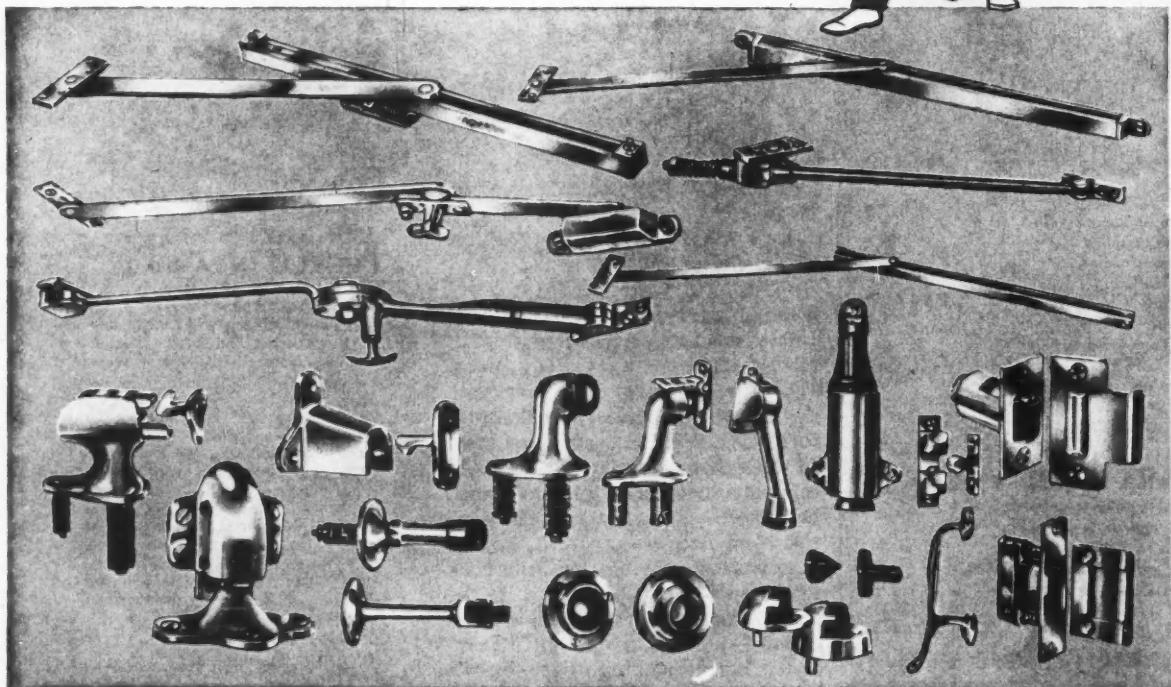
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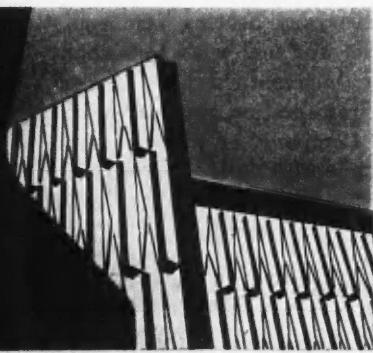
**GLYNN-JOHNSON CORPORATION**



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chicago 40, illinois

The best ideas are those earliest  
in concrete

## Tapestries of precast concrete give new Maytag headquarters a decorator's touch!



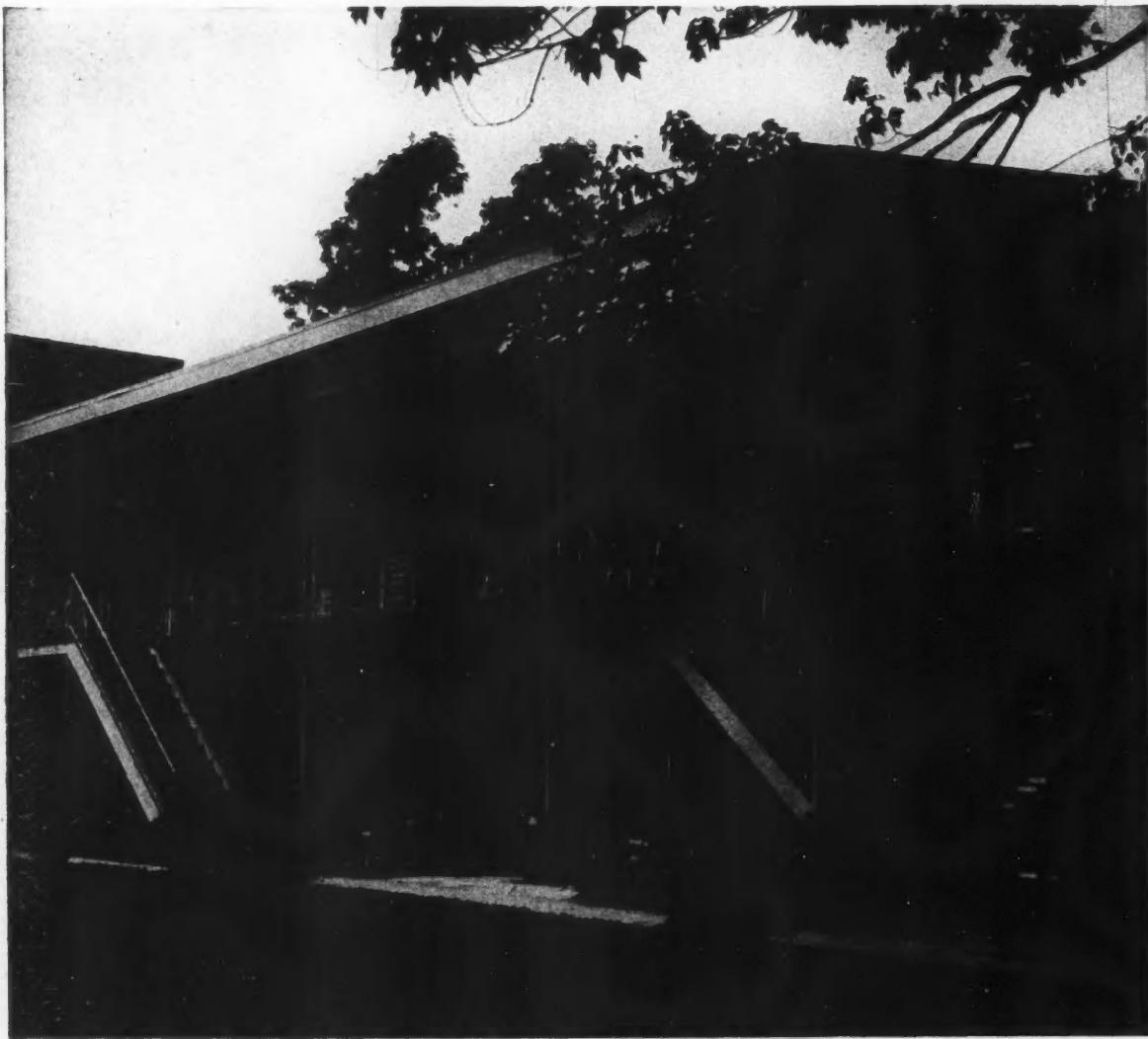
Panels are curtain walls on frame of reinforced concrete. An older building was connected to the new, unified by simply surfacing with identical panels. Architect: Brooks-Borg; contractor: A. H. Neuman Bros., Co.—Des Moines, Iowa.

Visitors receive an impressive and efficient introduction to the Maytag Company in this new office building at Newton, Iowa.

The huge concrete curtain wall panels, weighing up to 10 tons each, were designed as an original sculpture by Los Angeles artist, Malcolm Leland. Varicolored exposed quartz chips and white cement add sparkle to the panels' dramatic light and shadow effects. A trim of Italian mosaic tile demonstrates again concrete's compatibility with other materials. The same tile lines the entrance canopy.

Architects find spectacular effects are easily achieved and unusually practical in modern concrete.

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*A national organization to improve and extend the uses of concrete*



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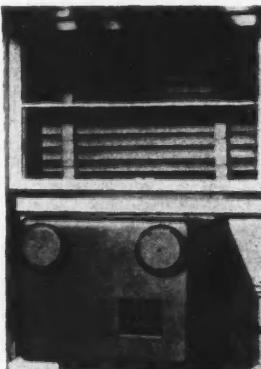
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precise control, speed, cleanliness, economy and dependability of supply. Gas can be the answer to your unusual or everyday heating problems.

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*American Gas Association*

**Right:** These units are installed at the Price Apartments, Nutley, New Jersey (shown above). Each apartment is individually heated to exactly the temperature desired by the occupants.



**FOR HEATING...  
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"The Gizmo", Students' Snack Room, Knox College. Architects: Perkins & Will. Plate 451.

## What to use for a "Gizmo" Floor?

Murray Quarry Tile was selected for this student eating area because of its warm earthy colors and its well-known durability. These new Ember Flash tiles give a pleasing mottled effect, and the 8" x 3 $\frac{1}{8}$ " size was used to achieve a subdued feeling of pattern. Quarry tile was preferred, too, in this heavy traffic area, because it is rugged, yet so easy to keep clean. Write for Murray Quarry Tile catalog 861.



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Division of American Olean Tile Company

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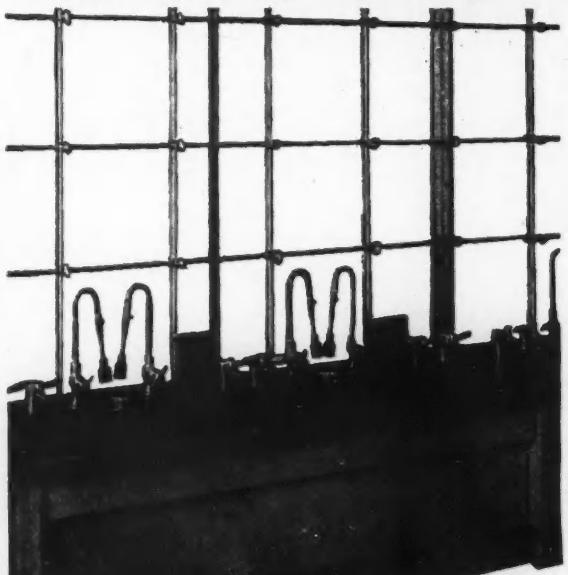


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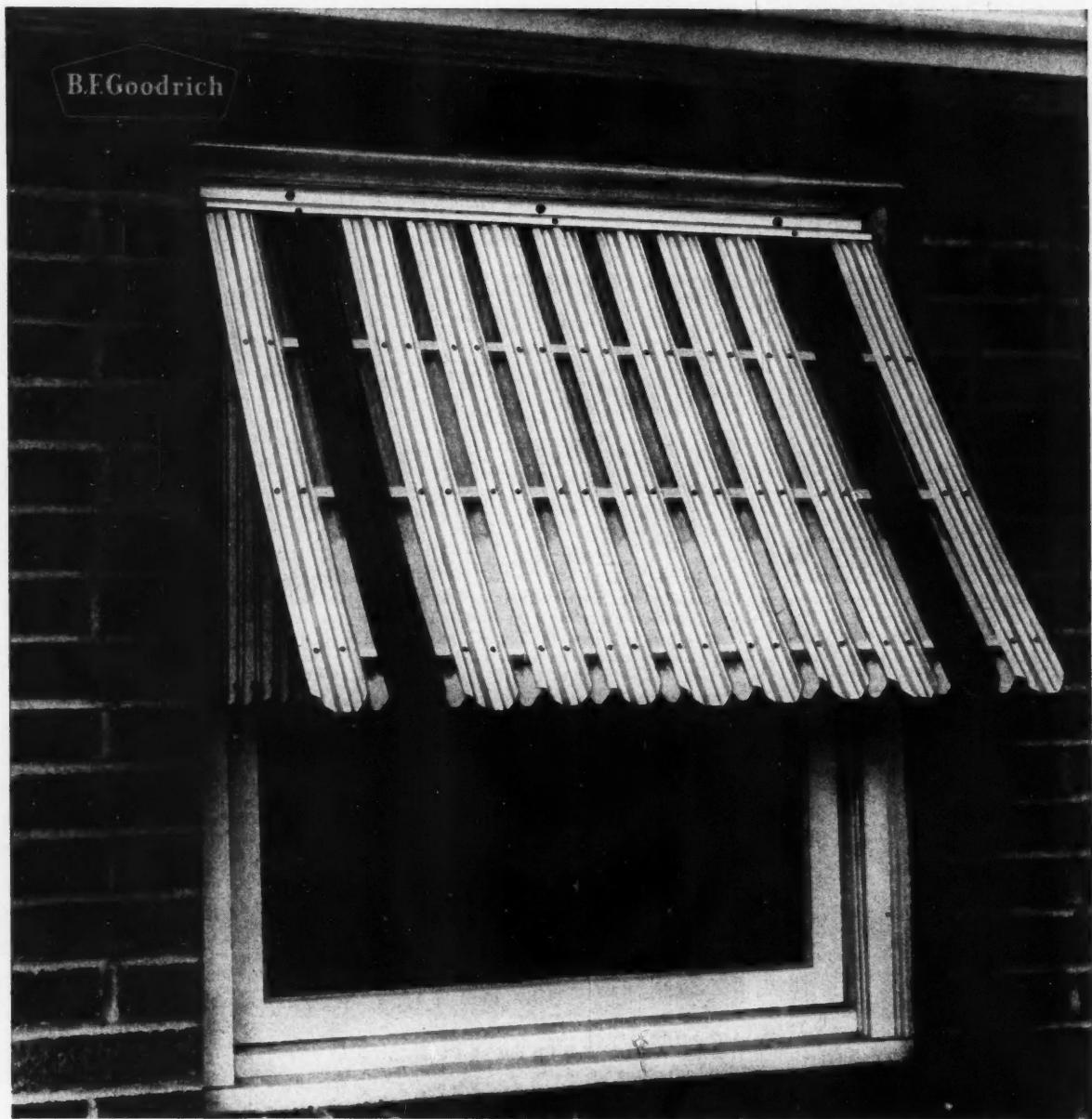
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Refer to 1961 Sweet's Catalog, Code: 27  
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170 MAGNOLIA AVE., WESTMINSTER, ILL.  
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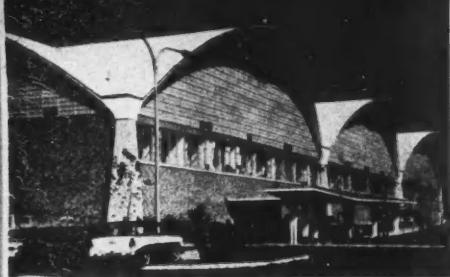
Color, corrosion resistance and strength—these are three reasons for the increasing use of rigid Geon vinyl in a wide variety of building products and accessories.

Here's another application opportunity opened by rigid Geon vinyl. Can it solve your problems? For information, write Department ND-8, B.F. Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. In Canada: Kitchener, Ontario.

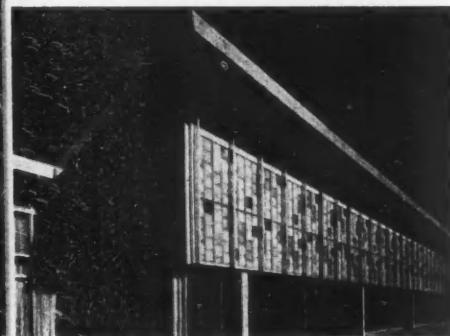
# B.F. Goodrich Chemical

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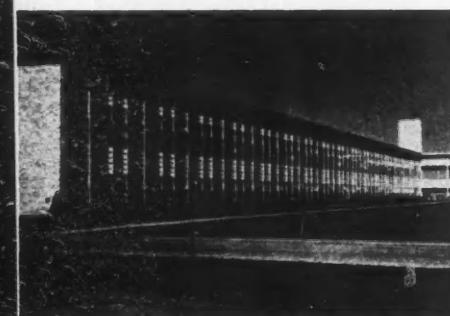




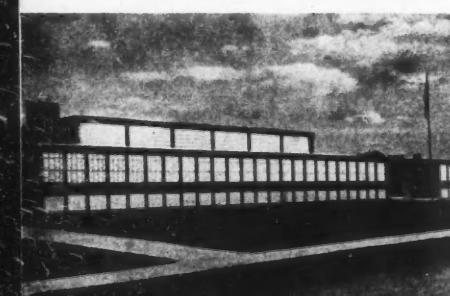
Light-controlling Thinline panels provide excellent natural light, help reduce heating and cooling costs for the new \$20-million Intelex Systems Post Office in Providence, R. I. Charles A. Maguire & Assoc., Providence, supervised design and construction.



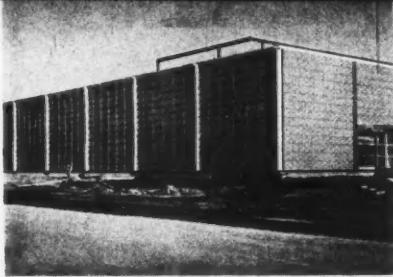
Northwest Suburban Y.M.C.A., Des Plaines, Illinois, is one of a series of new Y.M.C.A. buildings in the Chicago area in which Thinline is used. Y.M.C.A. architect Eugene White commissioned Eckroth, Martorana & Eckroth, Chicago, to design Des Plaines Y.M.C.A.



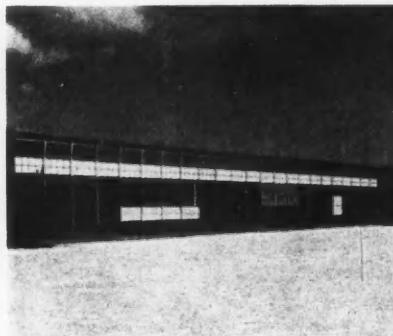
Architect Enos Cooke, New Kensington, Pa., used Thinline in a major way at Stewart Junior High School, Lower Burrell Township, Pa., blending light-controlling panels with windows and aluminum-faced insulating panels.



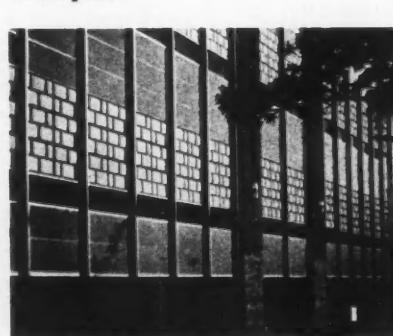
Extensive use of Thinline prismatic panels, in combination with gray glass and porcelain enamel panels, controls harsh sunlight and severe weather in John Quincy Adams School, West Allis, Wisconsin. Architect, Schutte, Phillips & Mochon, Inc.



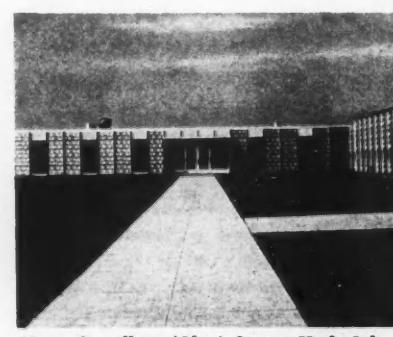
All exterior walls of the new research facility of Miles Laboratory at Elkhart, Indiana, designed by A. M. Kinney & Assoc., Cincinnati, will utilize the light-controlling features of colored Thinline panels. The ground-to-roof installation will provide a more pleasant controlled environment for modern research.



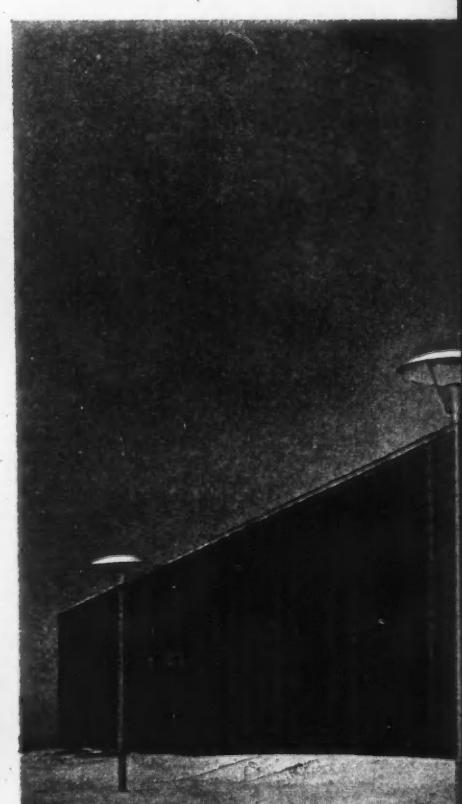
Thinline panels of Clear Vista, accented with ceramic colors, admit maximum light with low heat transmission in the new office building of the State Employees Building Corp., Sacramento, Calif. West America Engineering Co., Inc., San Francisco, designed the structure.



Lee Center School, Lee Center, Ill., used Thinline Curtain Wall for this new addition that has taken years off the appearance of the school. Samuelson & Sandquist, Chicago, architect.

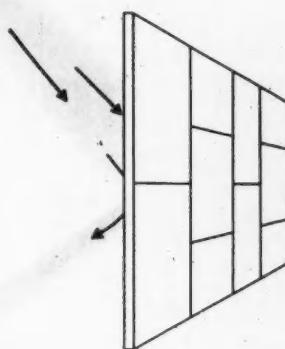


West Carrollton (Ohio) Senior High School (Architects—Outcalt, Guenther & Assoc.) features extensive use of prismatic and window panels to protect occupants from sun and weather in classrooms, corridors and cafeteria.





At Fontbonne Academy, Allegheny County, Pa., architects Celli-Flynn, McKeesport, combined light-controlling panels of green Thinline with window and metal panels to achieve this unusual effect in the classroom wing.



Thinline glass tiles achieve sun control with built-in prisms that disperse harsh rays softly and evenly to interior areas.

## THINLITE<sup>®</sup> curtain walls enclose buildings across the nation

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• **SUN CONTROL**

Thinline solar-selecting tiles diffuse sunlight on all exposures. Distribution of light is excellent and brightness is well controlled.

• **SOLAR HEAT CONTROL**

Tests show Thinline tiles transmit less solar heat than any other light-transmitting medium.

• **SAVINGS IN HEATING AND AIR CONDITIONING**

Significant savings in heat and air conditioning can be achieved with Thinline curtain walls. Tiles transmit less solar heat while the double-glazed construction guards against heat loss. Through-metal is kept to a minimum.

• **FACTORY-CONTROLLED PRE-FABRICATION**

All possible fabrication is performed at factory under controlled conditions. Field cutting and fitting is reduced to the barest minimum. Field caulking is unnecessary except at wall perimeters.

• **LOW MAINTENANCE COST**

Thinline glass tiles are self-washing. Colors are permanent and metal-work is durable anodized aluminum.

• **COMPLETE CURTAIN WALL SYSTEM**

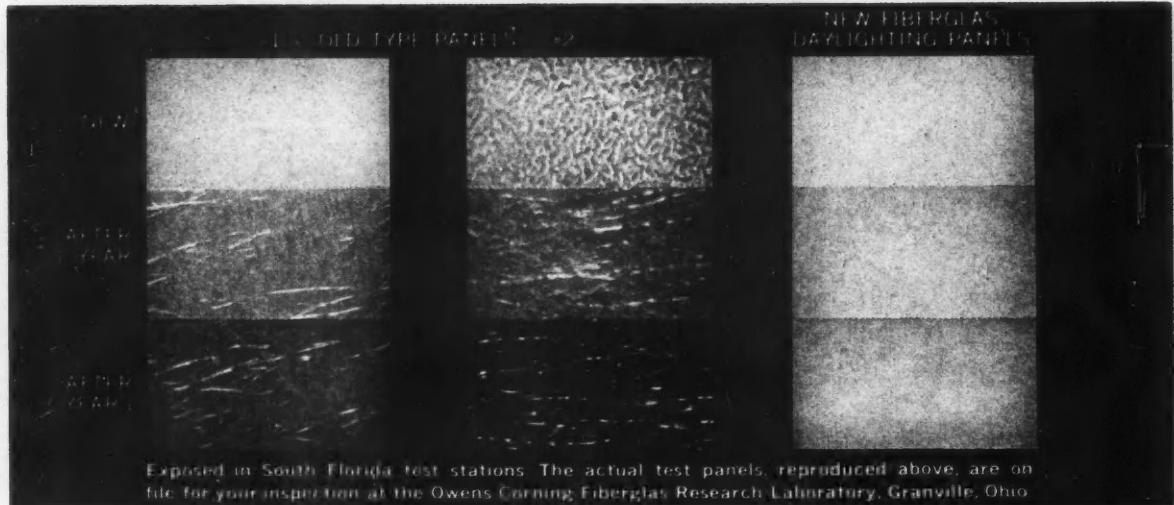
The Thinline system includes all necessary framing metal and parts, as well as glass or metal panels in 2' x 4' or 2' x 5' sizes.

For complete information including details, see Thinline catalog in 1961 Sweet's Architectural Files—Curtain Wall Section.

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# TESTS PROVE IT: FIBERGLAS DAYLIGHTING PANELS WITH DU PONT LUCITE® FIGHT WEATHER BEST

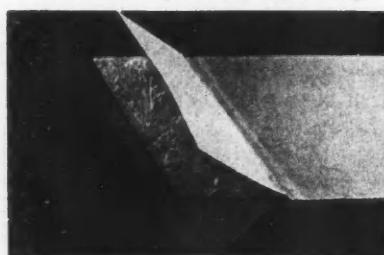


Exposed in South Florida test stations. The actual test panels, reproduced above, are on file for your inspection at the Owens-Corning Fiberglas Research Laboratory, Granville, Ohio.

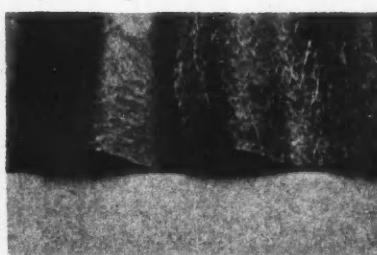
After three years weathering exposure, old type panels show: severe discoloration; extreme fiber "blooming"; up to 60% loss in light.

After three years weathering exposure, Fiberglas Daylighting Panels show: no discoloration; no fiber "blooming"; less than 10% loss in light transmission.

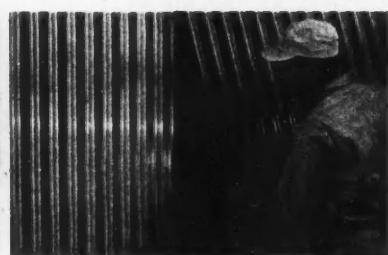
**THIS OUTDOOR EXPOSURE TEST . . .** conducted by an independent testing service . . . proves conclusively that Fiberglas\* Daylighting Panels stand up best to weather. What makes this amazing weather resistance possible? The combination of Du Pont Acrylic Lucite Sirup Resins and tough Fiberglas reinforcing. Together they form a strong, shatter-proof panel that is easy to install . . . one that allows you to choose color and light transmission properties and *know they will not be altered by years of weather exposure*. Use Fiberglas Daylighting Panels next time you want to open up dim interiors . . . let in natural daylight . . . reduce lighting costs . . . replace old sash and glass. For complete product data write to Owens-Corning Fiberglas Corporation, 717 Fifth Avenue, New York 22, New York.



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**NO SURFACE MAT MEANS NO PROTECTION!** For 18 months this ordinary plastic panel was exposed to weather. See how fibers have "bloomed" in exposed portion to the right. Fibers collect dirt and fumes, ruin panel's appearance, cut down light transmission.

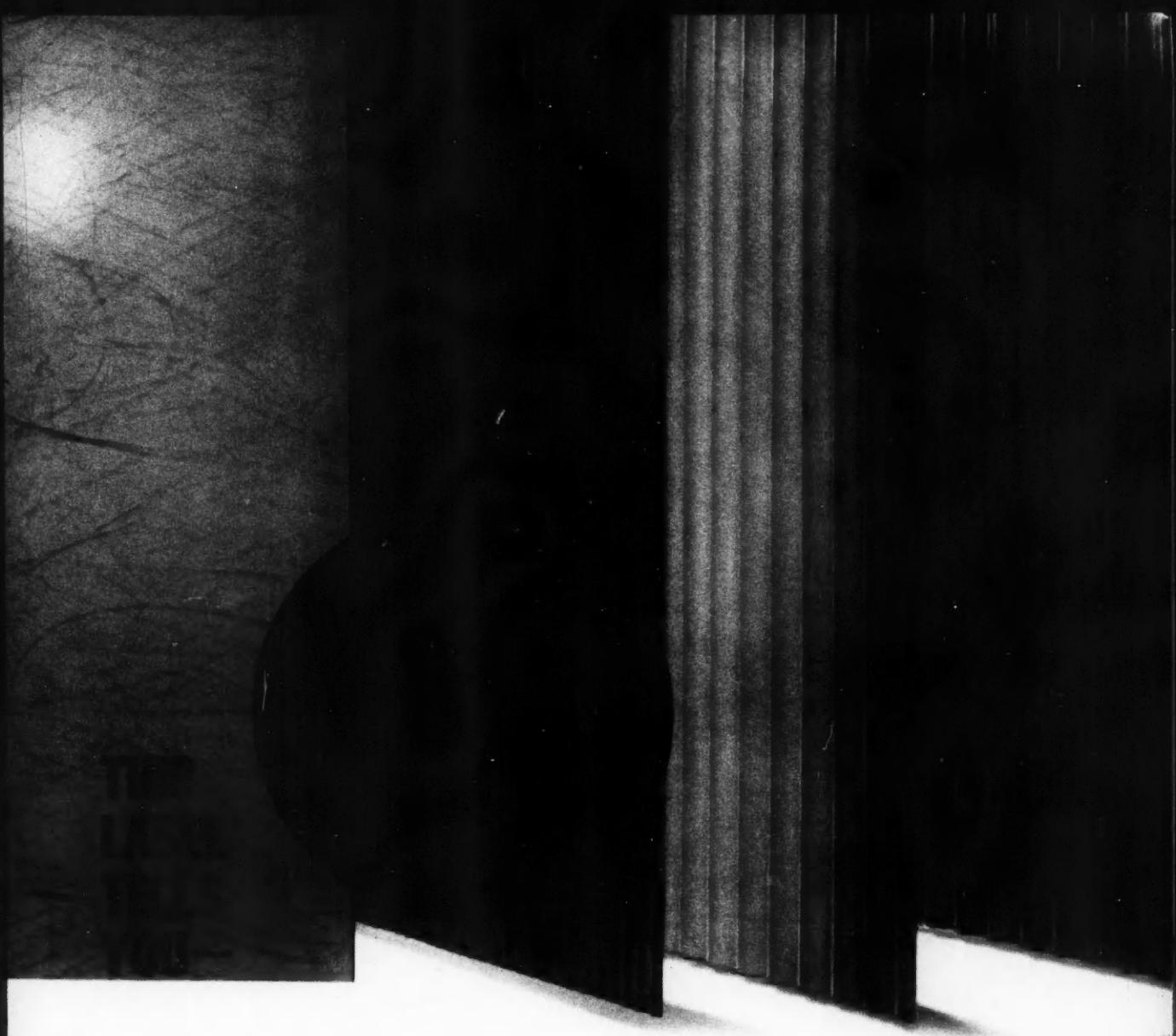


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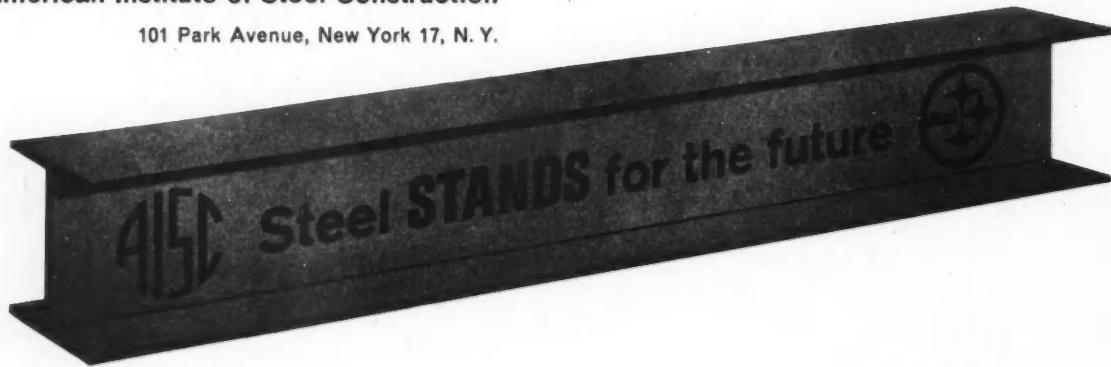
1. Construction costs
2. Rent
3. Personnel time traveling between plants

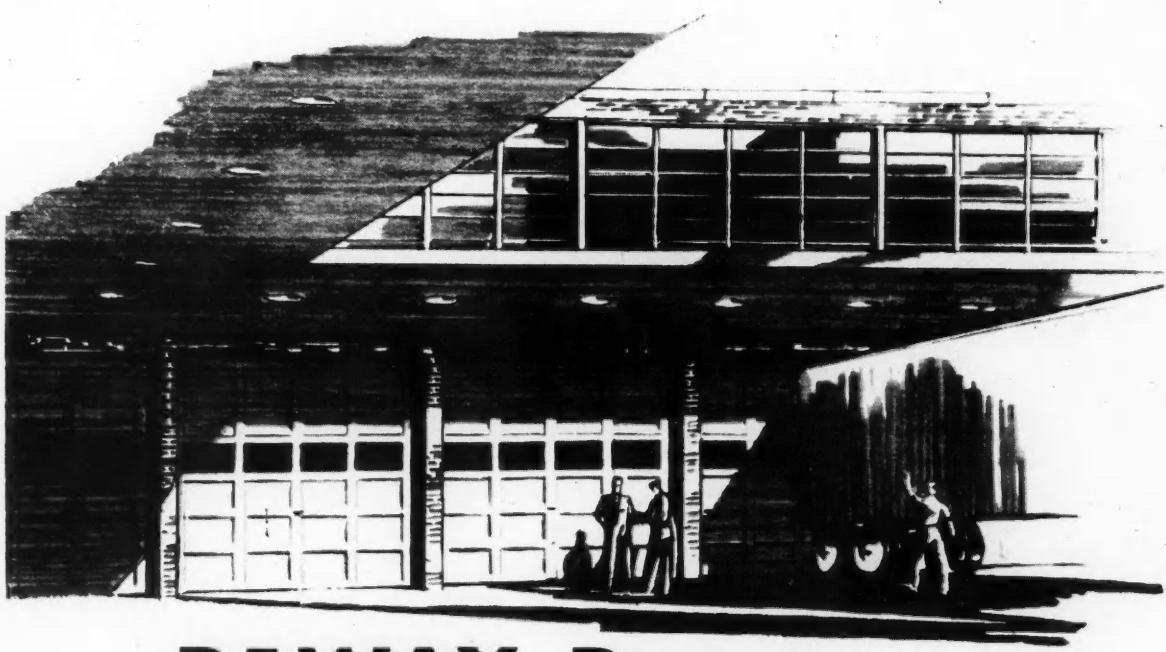
**Total direct savings - \$450,000.**

To save time and money—always build with STEEL.

**American Institute of Steel Construction**

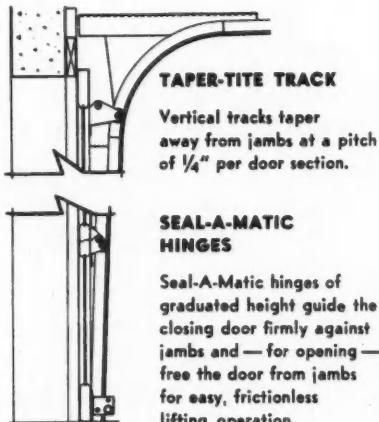
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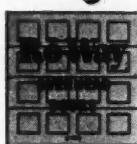
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*there's a RoWay for every doorway!*



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**ROWE MANUFACTURING COMPANY**

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Note how the Satin Chrome cover shown here blends with the decor of this modern office.

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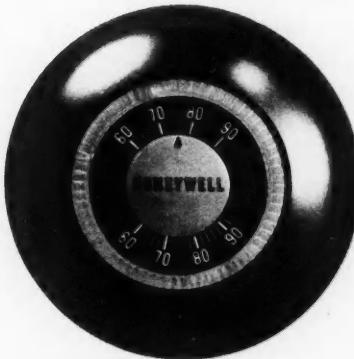
All the new finishes are available in both the pneumatic and electronic models. Call your nearest Honeywell office for sample color chips. Or write Honeywell, Dept. AR-8-153, Minneapolis 8, Minn. And be sure to tear out the color chart at right for handy reference. *Sales and service offices in all principal cities of the world.*

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OFF  
AND  
SAVE!

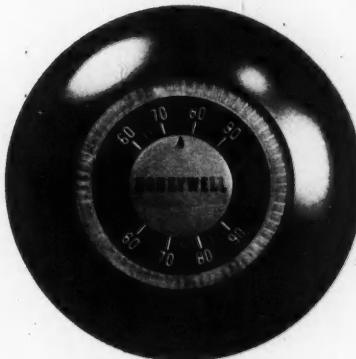
## WHICH FINISH BEST FITS YOUR DECORATING REQUIREMENTS?



**SATIN CHROME.** A brushed chromium plated surface. This finish supplied if no other specified.



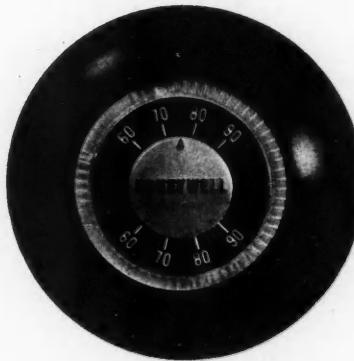
**POLISHED NICKEL.** A bright, plated surface with a little softer tone than the polished chrome.



**POLISHED CHROME.** A chromium-plated surface ideal for hospitals and other institutions.



**SILVER BRONZE.** A brushed silvery-bronze lustrous surface of baked-on enamel.



**STATUARY BRONZE.** A rich, darker brushed bronze tone, plated surface. Offers nice contrast.



**BOWER BARFF BLACK.** A soft, black painted surface that adds a unique decorating touch.



**BRUSHED BRASS.** A soft, brushed golden brass color, plated surface.



**POLISHED BRASS.** A gleaming golden-brass tone, plated surface.



**SATIN NICKEL.** A brushed plated surface that is neutral in tone.

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■ **MAXIMUM WEIGHT SUPPORT** by using a unique welded assembly of formed steel sheets under patent application as WACO-PLATE ■ **GREATER ACCESSIBILITY** with easily removed panels and completely removable steel frames ■ **CUT-OUTS ANYWHERE** without affecting the loading capacity of the Floor System ■ **APPEARANCE** through the elimination of cracks and seams . . . made possible by WACO's Precision Manufacturing Method ■ **STRENGTH** through steel and *customer proven* for durability ■ **SAFETY TESTED** by National Test Laboratory.

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■ WACO can offer all of the above Quality Factors in every Free Access Floor System and consistently give their customers *on time installation* at the *lowest cost* ■ WACO Precision Manufacturing Methods lower the customers' initial cost as a result of assembly line production ■ WACO lowers the on-site installation cost and still maintains precision results . . . these are the reasons that when you think of computer flooring . . . think *cost-wise* . . . think WACO.

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Panel Products Division



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INTERCOMMUNICATION

The Accepted Symbol of Quality and Dependability

Only the New TALK-A-PHONE has these exclusive features!

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- **"PRIVATE" or "NON-PRIVATE" MASTERS and STAFFS.** Converse in privacy, answer calls from a distance.
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**PLUS . . .** Incoming Call Chime; Busy Signal; Monitoring Signal; External Relay Control; Reciprocal Power Supply . . . all as standard features of the New TALK-A-PHONE

Proportioned like a book, only 3-inches high. The look and feel of fine-grained leather, with the strength and rigidity of steel. In charcoal gray and brushed chrome.

A.I.A. File Number 31-i-51

Write for free brochure and name of nearest distributor **TALK-A-PHONE CO.**  
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OUR MILL. NO ORDER TOO LARGE OR TOO  
SMALL. SAMPLE CUTTINGS AVAILABLE.**

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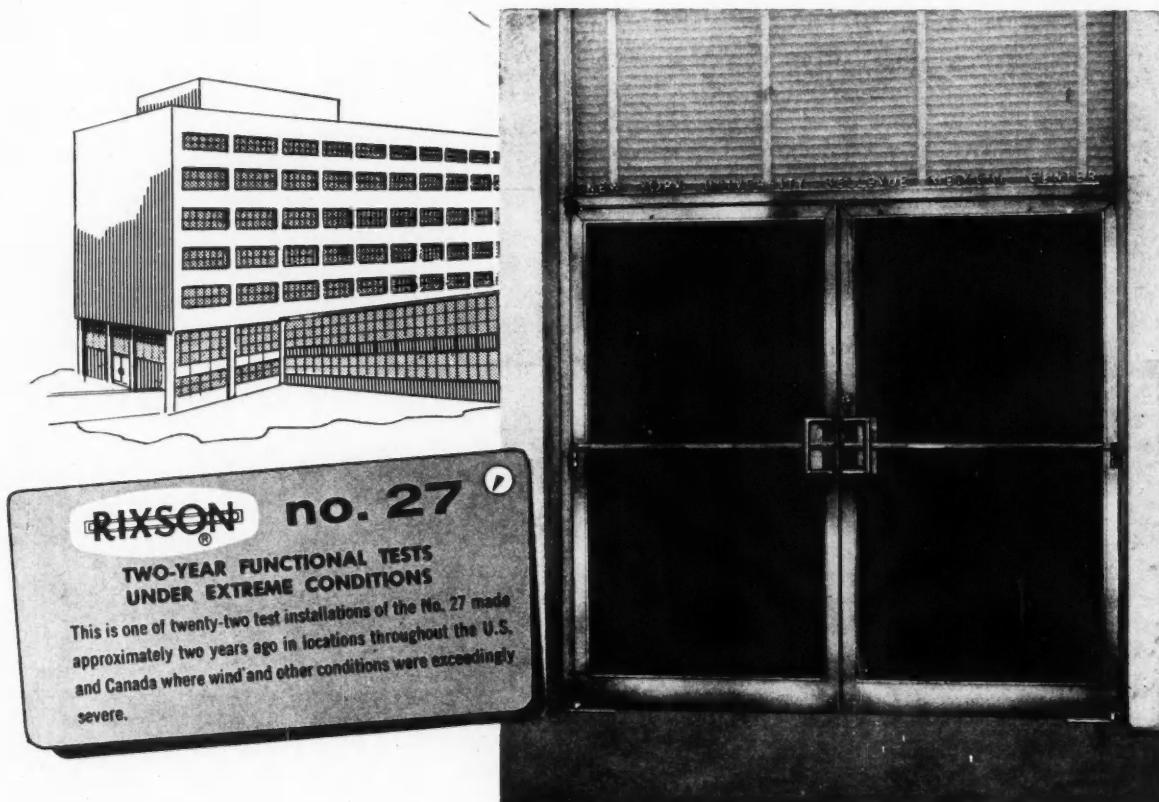
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# No. 27 CLOSER solves door control problem at New York Univ. Medical Center in two-year test installation

*"The first door control to stop glass breakage caused by strong East River winds..."*

says P. W. Barton, CONSTRUCTION COORDINATOR

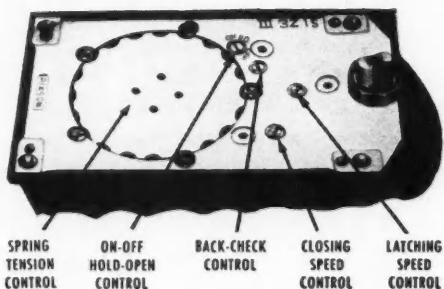


Skidmore, Owings and Merrill, Architects

## A COMPLETELY NEW DOOR CLOSER DESIGN

no. 27 offset hung

no. 28 center hung



These New York University Medical Center south entrance doors are exposed to powerful East River winds which blow from both directions. Before the No. 27 closers were installed there was frequent glass breakage and closer damage.

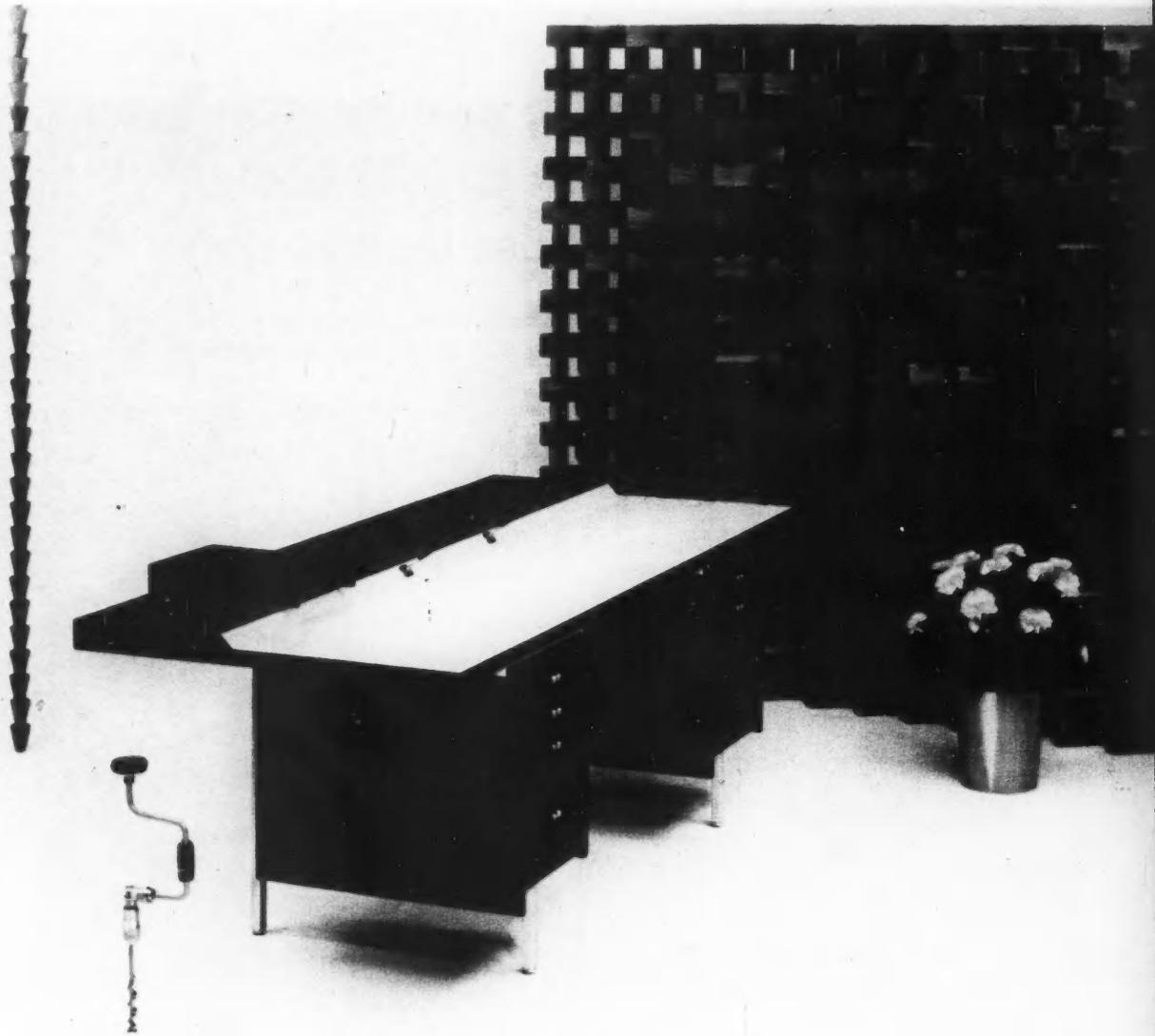
The back-check of the No. 27 closers, locally adjusted for firm resistance, together with the positive dead stop, now keep the opening action of these doors under constant control. The closing action of the doors is under dependable hydraulic check with closing and latching speeds each independently adjusted to cope with the wind conditions.

Complete literature and details on the No. 27 offset hung and No. 28 center hung closers will be mailed on request.

THE OSCAR C. RIXSON COMPANY

9100 west belmont ave.  
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CANADIAN PLANT:  
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## THE TEMPLATE GROUP

Here's a desk for the top executive. Split-level top and lifetime pens mounted in place. Color possibilities to correlate with the office decor. And workmanship in wood as you expect from a firm that has been building desks for over sixty years! You will enjoy planning with The Template Group . . . to specify each modular unit with an almost unlimited number of options. Brochure? Write The Leopold Company, Burlington, Iowa.



Designer: Charles Deaton

## THE LEOPOLD COMPANY



**TOP** The mortgage loan department of the Western National Bank, Cicero, Illinois. Architect: Frank Louis Velet, Berwyn, Illinois. Desks from The Template Group were selected for officers and secretaries.

**CENTER** Executive desk with top overhang at front and sides is combined with matching closed-front cabinets from The Template Group in this New York office of Merrill Lynch, Pierce, Fenner & Smith, Inc.

**BOTTOM** A functional layout for the First National Bank of Minneapolis, Minnesota. Architect: Holabird and Root, Chicago. Desks are from The Template Group, by Leopold.

**THE LEOPOLD COMPANY**  
Burlington, Iowa

## *The Record Reports*

### INDUSTRIAL BUILDING CONGRESS STRESSES BUILDING DESIGN

An estimated 2800 industry personnel, architects, engineers and others concerned with building factories and plants attended the Second Industrial Building Exposition and Congress held September 25-28 at the New York Coliseum. Those assembled represented the United States, Canada, Mexico, Puerto Rico, Holland, Finland, Sweden and Great Britain.

The twin events are intended to provide a forum where problems of new construction and modernization are discussed and bring together industry management personnel, architects, engineers and others concerned with industrial buildings.

Nineteen sessions of the Congress covered many aspects of new construction as well as modernization of existing facilities. Among the topics were: site selection, construction in foreign countries, heating and air conditioning, selection of architects and builders, lighting, control of costs, provision for expansion and recent developments in construction methods and materials. One of the sessions, which developed into a debate on the place of the architect and the engineer, was of particular interest to architects.

Addressing several of the sessions were leading architects and engineers (including Felix Candela, of Mexico; John C. Parkin, F.R.I.B.A., of Canada; Louis Menk, A.I.A., Detroit; Frank L. Whitney, New York; and Dudley Hunt Jr., A.I.A., senior editor, ARCHITECTURAL RECORD), builders and consultants.

Among the companies whose executives discussed their own experiences with new construction and modernization were Westinghouse Electric, Goodyear Tire & Rubber, General Electric, Atlantic Refining, Martin, Parke Davis, Upjohn, du Pont, I.B.M., Haloid Xerox, Squibb, Procter & Gamble, Ford and Sylvania Electric.

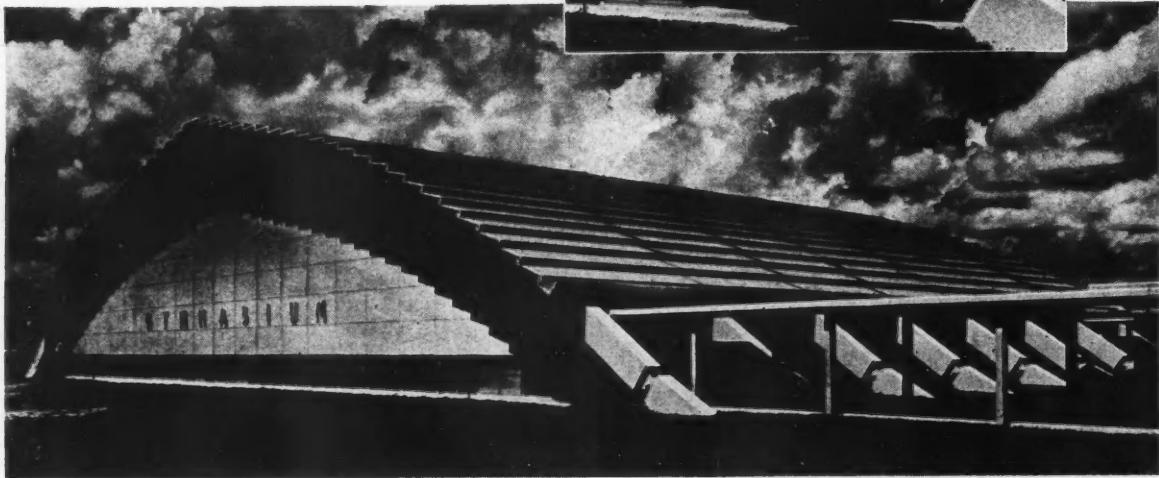
In an address on "The Effect of Building Design on Employee Morale and Productivity," R. F. Denig, superintendent, plant engineering, Western Electric Co., Inc., New York, concluded: ". . . employees respond with improved efficiency and morale when management demonstrates a *continuing* interest in their welfare. Gradual improvement over a period of years is often more effective than a sudden pretentious change."

John B. Ortman, manager, plant engineering services, Sprague Electric Co., North Adams, Mass., in a talk on "Effective Procedures for the Owner Who Builds Infrequently", advised, "Whether building frequently or infrequently, the selection of a good architect and builder will probably contribute more toward a successful building program than any other expenditure of equal time and money."

Wendell Anderson, director of facility planning, AMP Inc., Harrisburg, Pa., spoke on "Modernizing Your Facilities". Summarizing low cost modernizing steps that his company has found effective and easily accomplished, he listed ten points: (1) If modernizing your existing plant would be difficult, look for an existing building that can be purchased and adapted. (2) Use "cover-up" materials—concrete block glaze, epoxy

*continued on page 94*

# UNUSUAL PRECAST CONCRETE DESIGN for GYM ROOF



- Modern precast concrete was imaginatively used to achieve an outstanding combination of function and beauty in Miami Central High's new gymnasium.

The three-hinged arches were cast on a concrete form at Precast Corporation's plant for minimum tolerances and maximum uniformity. In place, they rise directly from buttress footings supported on precast piling. Unusual precast roof slabs span the 16' between arches. In addition to upward and downward legs for a shingle-type fit, the slabs also have a unique facing of glazed tile.

Lehigh Early Strength Cement was used for peak efficiency in the production of all precast units. In precasting the arches, for example, its use made it possible to turn out two arch-halves a week from a single form.

Lehigh Portland Cement Co., Allentown, Pa.

The small picture above shows shape and ceramic tile finish of roof slabs. Each panel spans 16', is 2" thick, and 4' wide including upward and downward legs. Special units at bottom act as rain gutter. Aqua colored high-glaze tile was applied by casting it integrally with the slabs as a form liner. Tiles were later grouted and given a coat of silicone waterproofing.

View of completed gym speaks for its grace and practicality. Roof slabs were attached only by welds to dowels in the arches, solving problems involving thermal expansion and contraction. Then joints were covered with sheet copper strips set in a caulking compound.

#### Miami Central High School Gymnasium

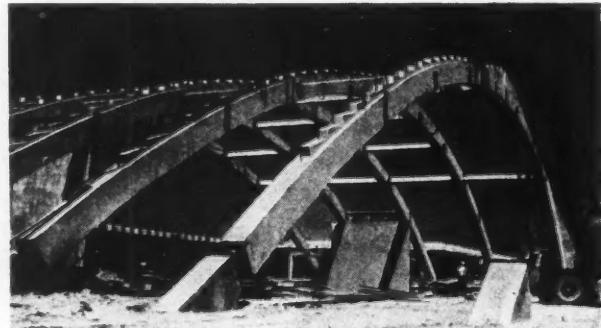
*Architects:* Polevitzky, Johnson & Associates

*Structural Engineers:* H. J. Ross Associates

*Contractor:* Thompson-Polizzi Construction Co.

*Fabrication/Erection of Precast Concrete:* Precast Corp.

All of Miami, Florida



Each of the arches spans 160' and is spaced 16' center to center. The arch skeleton is braced by precast lateral members with welded connections. Gym floor space is 12,000 sq. ft., and there is a 10' wide covered walkway on each side. Note "steps" and projecting dowels cast into arches for securing roof panels.

**LEHIGH**  
CEMENTS

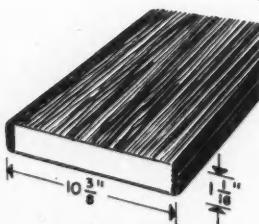


FREMONT UNION HIGH SCHOOL, SUNNYVALE, CALIFORNIA  
 ARCHITECTS: MASTEN, HURD AND GWATHMEY  
 BUILDER: FRIETAS CONSTRUCTION COMPANY



## wood folding partitions

*give sturdy beauty to space control*

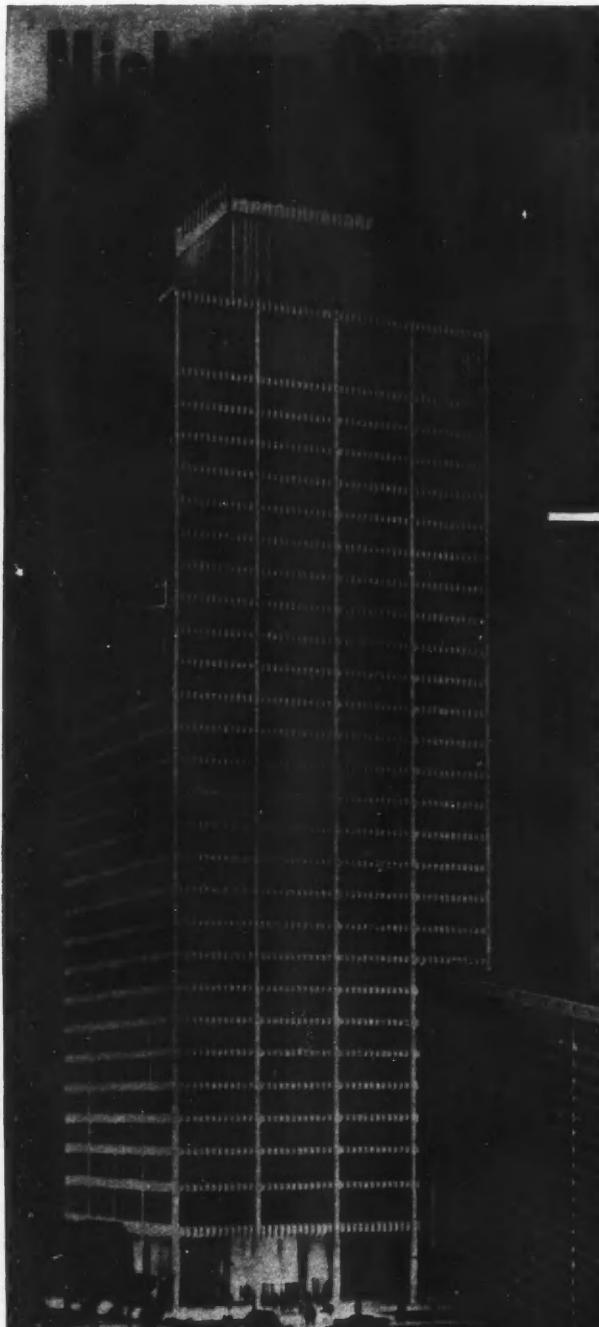


STABILIZED WOOD CORE of each panel is laminated with water-resistant plastic glue and faced with genuine wood veneer.

PELLA WOOD FOLDING PARTITIONS are handsome enough for classroom, auditorium, church or club—sturdy enough for recreation halls and other active areas. The play of light and shadow on any one of six genuine wood veneer grains can add interest and warmth to your building interiors. The stabilized wood core of each panel plus patented "live-action" spring hinging maintains panel alignment, assures years of trouble-free service. Even the largest units operate with surprising ease. Massive  $10\frac{3}{8}$ " x  $1\frac{1}{16}$ " panels. Available for any opening width and any height to 20'1". Call your PELLA distributor in the Yellow Pages for specifications and literature. ROLSCREEN COMPANY, PELLA, IOWA.

6 Fine Wood Veneers: ASH • OAK • PHILIPPINE MAHOGANY  
 AMERICAN WALNUT • BIRCH • PINE

PELLA ALSO MAKES QUALITY WOOD FOLDING DOORS, WOOD SLIDING GLASS DOORS, WOOD CASEMENT AND MULTI-PURPOSE WINDOWS AND ROLSCREENS



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New Forms and Systems Achieve  
Striking Effect of Soaring Grace

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to temper the air delivered to the unique new  
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Modern smooth-fin design of Aerofin coils permits ample heat-exchange capacity in limited space. Where desired, it also permits the use of high air velocities without turbulence or excessive resistance.

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Aerofin hot-water heating coils (illustrated) and chilled-water cooling coils contribute to the year-round comfort of this outstanding new building.

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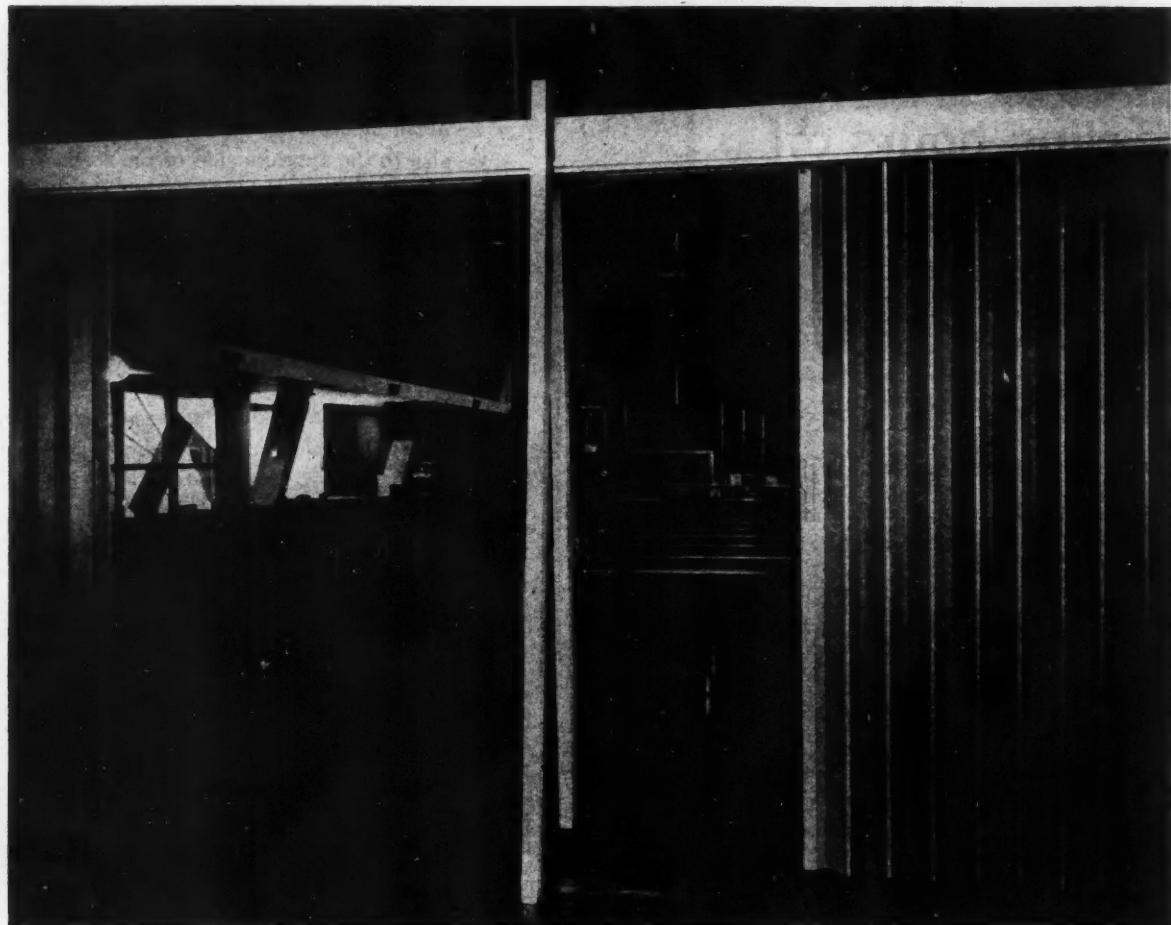
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*Aerofin is sold only by manufacturers of fan system apparatus. List on request.*

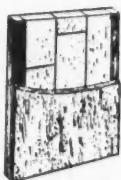
ENGINEERING OFFICES IN PRINCIPAL CITIES



ST. MATTHEWS EPISCOPAL CHURCH, PORTLAND, OREGON. ARCHITECT: DONAVAN B. BYERS



## wood folding doors *and novel ideas attract each other*



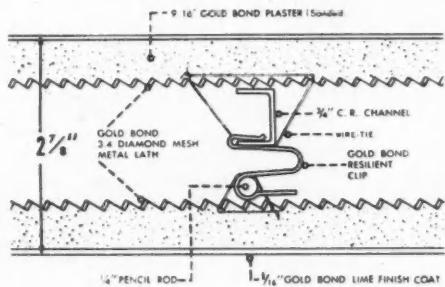
**SOLID WOOD "LAMICOR" PANELS**  
are laminated with  
water-resistant, plastic  
glue and faced with  
wood veneer.  
Will not warp.

How would you design a closure without building up to a lofty ceiling? In this case, a beam, struts and PELLA WOOD FOLDING DOORS provided a successful solution. The design latitude of these fine doors runs from their honest wood beauty to their maintenance-free operation. 6 genuine wood veneers are available to reflect color and texture. These, you can specify factory-finished or unfinished. Patented "live-action" steel spring hinging assures effortless operation for even the largest units. Available for any width and heights up to 12'1". Full specifications in SWEET'S. Consult the classified telephone directory for name of your nearest U. S. or Canadian distributor. ROLSCREEN COMPANY, PELLA, IOWA.

6 FINE WOOD VENEERS • AMERICAN WALNUT • WHITE ASH • BIRCH • OAK • PINE • PHILIPPINE MAHOGANY

PELLA ALSO MAKES QUALITY WOOD FOLDING PARTITIONS, CASEMENT AND MULTI-PURPOSE WINDOWS, ROLSCREENS AND WOOD SLIDING GLASS DOORS

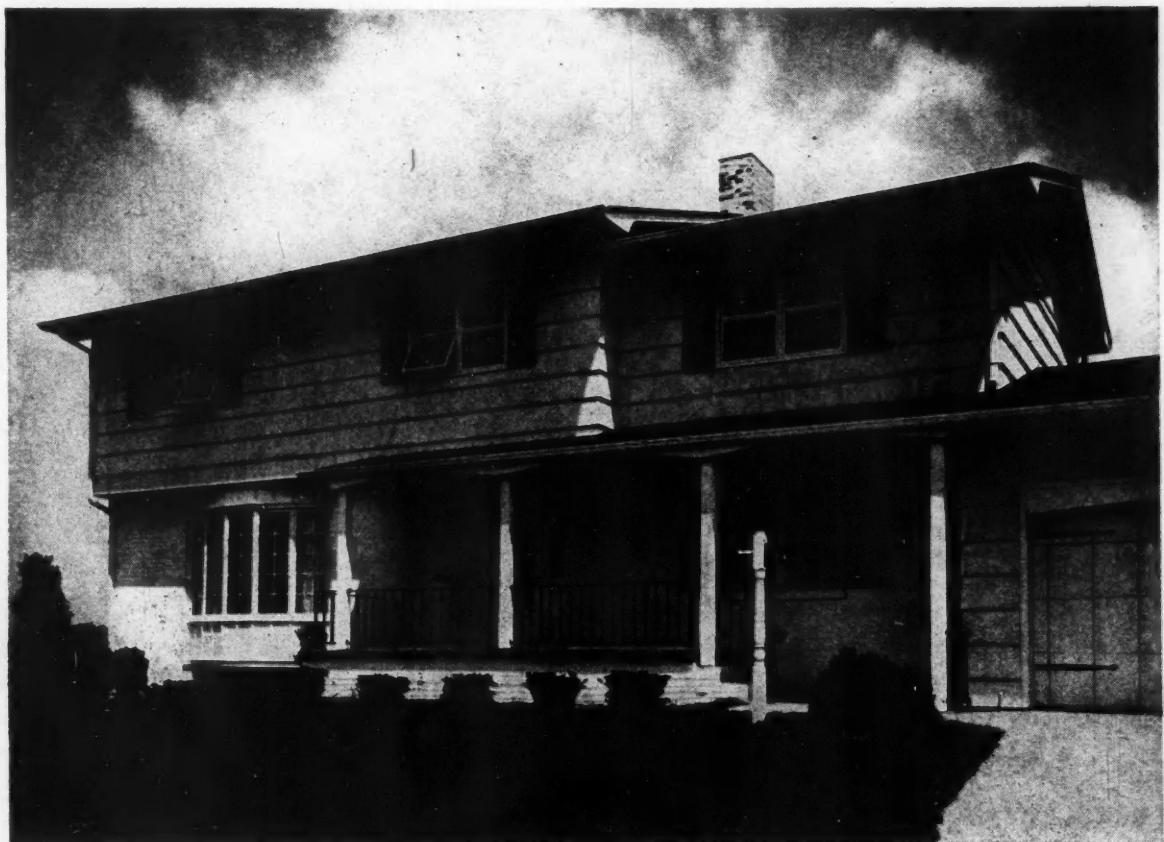
# New $2\frac{7}{8}$ " Resilient Partition clips hours off construction time



and gives you a noise-reducing, spacesaving wall with a sound-transmission loss rating of 42 db. It's so simple. First, pencil rod is secured to one side of the  $\frac{3}{4}$ " channel studs with resilient clips. Then Gold Bond Diamond Mesh metal lath is wire-tied to the rods and also to the opposite side of the studs. Apply  $\frac{9}{16}$ " of sanded plaster to both sides of the lath and finish with a  $\frac{1}{16}$ " lime-putty coat.

That's it. You have a partition that saves space, cuts down on noise transmission. And satisfies the most demanding client. Ask your Gold Bond® man for a demonstration. (It's worth a few minutes of your time just for the time it will save you.) If you'd rather, write to National Gypsum Company, Dept. AR-111, Buffalo 13, N. Y.





## wood casement windows *join into bays of any angle*



### ROLSCREEN®

on PELLA WOOD CASEMENT WINDOWS is the original inside screen that rolls down, up and out of sight.

Joining mullions for angular or circular bays can be made in any angle. 30°, 45° and 60° mullions are standard items. The design versatility of PELLA WOOD CASEMENT WINDOWS is expressed here in the bow arrangement and its harmony with the PELLA WOOD TWINLITE® WINDOWS in the rest of the house. Features like self-storing screens (PELLA WOOD CASEMENTS feature the famous ROLSCREEN® that rolls up like a window shade) and storm sash—plus muntin bars that snap in and out for easy painting and glass cleaning—enable you to combine traditional styles with the most advanced window conveniences. For maximum design freedom, PELLA WOOD CASEMENTS include 18 ventilating units up to 24" x 68" glass size and an exceptional range of fixed units. For full specifications, consult SWEET'S or your nearest U. S. or Canadian PELLA distributor in your classified telephone directory. ROLSCREEN COMPANY, PELLA, IOWA.

PELLA ALSO MAKES QUALITY WOOD MULTI-PURPOSE WINDOWS, WOOD FOLDING DOORS AND PARTITIONS, ROLSCREENS AND WOOD SLIDING GLASS DOORS



## Unique electrical facilities speed service to Jack Tar Hotel

Electrical energy is the key to comfort and convenience at San Francisco's new Jack Tar Hotel. Electric signs direct the traveler to a parking spot. Closed circuit TV, automatic key delivery and an illuminated control board help speed the guest to his air conditioned room. At check-out time even the invoicing is handled electrically. The block square site keyed to individual guest convenience, is also powered up for group functions from swimming and skating parties to conventions. The Jack Tar boasts a ballroom, modern theatre-auditorium, three dining rooms, a multi-level garage and a 12-story office wing—in addition to 400 guest rooms complete with all the electronic comforts known. Behind these facilities stands an electrical system staffed with equipment that performs without attention, quietly and reliably. On the following pages are some of the Westinghouse members of this staff at work shaping electricity to serve people—more reasons why—You can be sure . . . if it's Westinghouse.



Owner: Jack Tar  
Hotels, Galveston, Texas  
Designing Architect:  
Thomas M. Price,  
Galveston, Texas  
Supervising Architects:  
Hertzka & Knowles,  
San Francisco  
Consulting Engineer:  
Joe Poole & Associates,  
Houston, Texas  
Supervising Consulting  
Engineer: Buonaccorsi  
& Murray,  
San Francisco



General Contractor:  
Cahill Company,  
San Francisco  
Electrical Contractors:  
Emil J. Weber and  
Brayer Electric  
Company, San Fran-  
cisco (Joint Venture)  
Westinghouse  
Distributor: WESCO,  
San Francisco

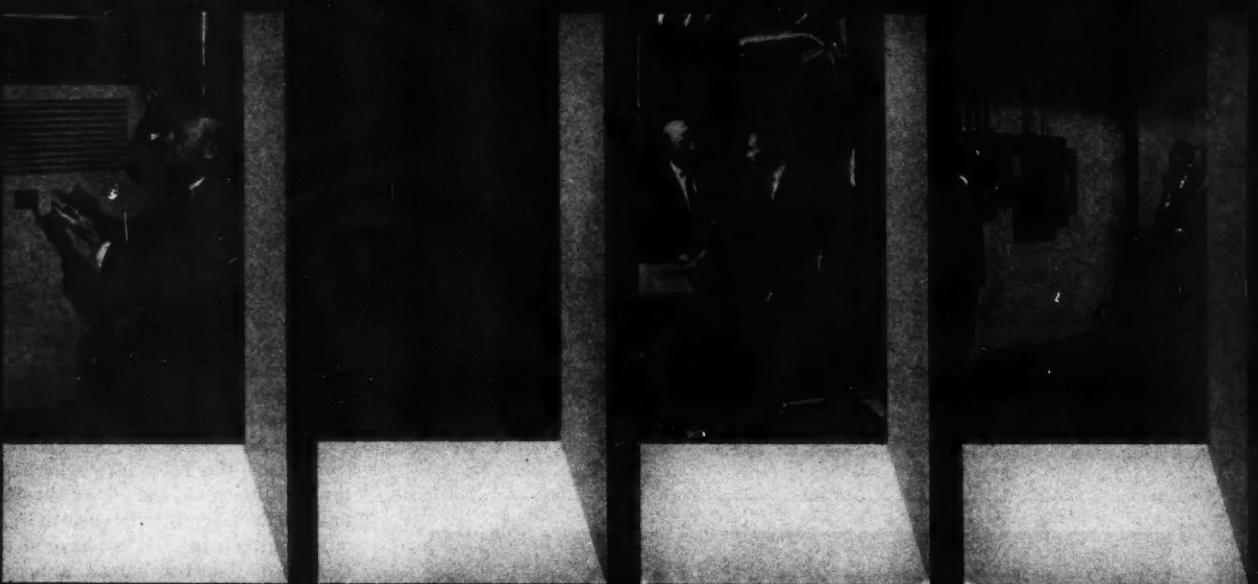
Above: Looking at runs of 2,000 and 3,000 ampere low-impedance bus duct are J. R. Miller, Westinghouse; Emil Weber, Electrical Contractor; Lloyd Dehrer, Chief Electrical Engineer, Buonaccorsi & Murray; and M. P. Buswell, Westinghouse. Low-impedance bus duct provides highest efficiency of power distribution. Full power is carried from the switchboard to loads throughout the hotel. Bus duct is custom fit for each installation — blends with surroundings.



Close coordination with people makes Westinghouse a valuable member around a drawing board. Some of the planners behind this hotel innovation are: left to right, E. J. Weber, Electrical Contractor; R. F. Cahill, General Contractor; G. K. Williamson of Jack Tar Hotels; J. L. Dellos, Project Engineer, Weber Electric; and M. P. Buswell, Westinghouse.

Delicate electronic devices throughout the hotel are dependent upon reliable power distributed by Westinghouse building type switchboards. DB-25 air circuit breakers used here protect against short circuits and overloads, while current limiting fuses guard against high fault currents.





This quiet, compact Westinghouse DT-3 dry type transformer works well at the Jack Tar. Wherever quiet operation is essential, as here, specify Westinghouse transformers—they test below 45 db in an ambient of 24 db and *only* Westinghouse sound tests every production line transformer. This unit steps down 480 volts to 120/208 for utility requirements serving guest conveniences.

The low case temperature of another Westinghouse dry type transformer is attested to by Lloyd Dehrer and Don Hartman, Westinghouse Construction Engineer, whose hand is resting on the case. Circling them are wall-mounted heavy duty Westinghouse safety switches, ranging from 100 to 250 amperes. Behind Mr. Hartman is a compact lighting panelboard. Compact size of Westinghouse DT-3 transformers allows best use of space, saves installation time.

Don Hartman points out the Westinghouse extra benefits in panel-board construction to Emil J. Weber and Lloyd Dehrer. Custom-fit for each installation, the panelboards incorporate the standard Westinghouse proven parts. AB de-ion circuit breakers control and protect against overloads and short circuits.

Grouping of starters in a Westinghouse 480-volt motor control center allows for centralized operations, easy maintenance and more uniform appearance. George Brayer, Emil J. Weber and Spense Pors, Wesco, discuss controls for air conditioning and refrigeration. Seen here are sizes 1 through 4 starters, many with pushbuttons and selector switches.

J-94175-4



Westinghouse

## The Record Reports

continued from page 83

paints, plywood panels, asphalt floor tile, etc. (3) If you have a noisy operation look into reducing the noise level. (4) Look for ways to simplify your power distribution system, give it flexibility. (5) Color code your piping system. (6) Satisfy auxiliary heating needs with resistance heating equipment. (7) Landscape your grounds. (8) Revamp your lighting system. (9) Put in music over a speaker system. (10) Ventilate your plant properly.

### Candela, Parkin Speak



John C. Parkin



Felix Candela

In a session entitled "Comparing Design and Construction Approaches in Other North American Countries," Mr. Candela spoke on shell construction, showing slides of shell structures from among the more than 300 he has designed and built. Mr. Parkin, in describing the differences between Canadian and U.S. architecture, declared they stemmed "as much from a difference in cultural aspirations as from technical disparities . . . Virtuosity for its own sake—the relentless search for innovation—and the 'star system' have little place in our culture or in our architecture . . . we have no national architectural heroes, and relatively few of the international variety . . . It is no mere coincidence that the one person who has exerted the greatest single influence on architecture in Canada today is Mies van der Rohe . . . his 'internationalist' background has particular appeal in a nation of multi-lateral interests . . . his no-nonsense vernacular is especially appropriate in a country of no-nonsense budgets . . . the very anonymity of his style has its own special appeal to many of us."

"Restraining" influences on Canadian industrial architecture, said Mr. Parkin, have been "more stringent budgets than the U.S.; a narrower range of available materials; less productive labor and with it less mechanization of technique; restrictive building codes and practices; and high land costs."

"Immediate and practical factors offering encouragement in the development of quality . . .," continued Mr. Parkin, "are continuous development of highly zoned, properly restricted industrial estates in close proximity to pools of skilled labor; growth of fully integrated Canadian architect-engineer organizations with the same wide scope of services available as in this country—new firms whose principals are young, well-trained and inventive; an increasing determination on the part of the consultant professional to make virtue out of necessity in the matter of restricted budgets."

Citing some of the "valid answers to the problems of creating architectural richness" as imaginative landscaping, careful siting, suitable graphics and sign control, precise detailing of essential elements as points of special interest (such as canopies,

continued on page 110

# Torjesen

## LeadX®

### ACOUSTICAL CURTAINS

ELECTRIC VERTICAL OPERATION

### WITH Chalk Panels



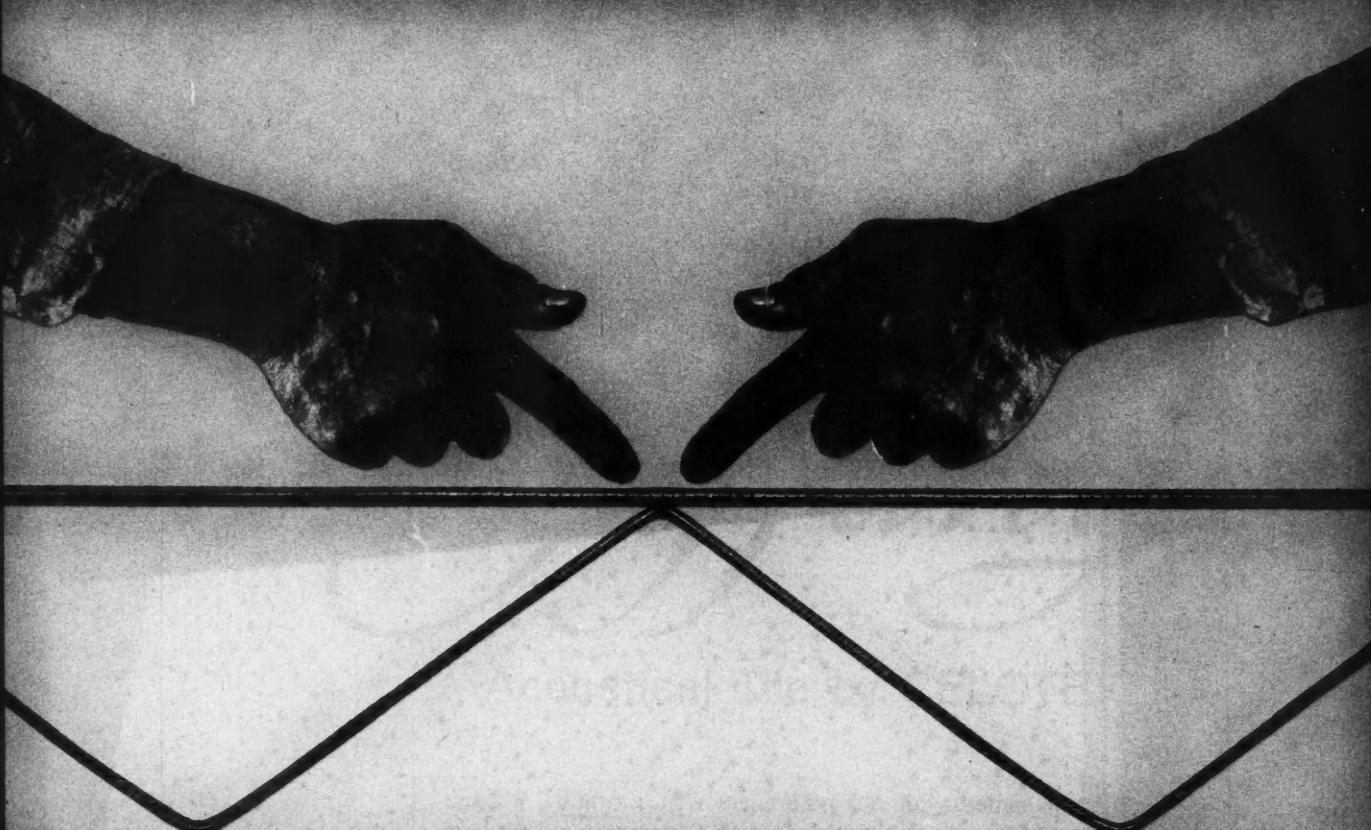
#### FEATURES:

1. Available with chalk panels and chalk pockets.
2. Electrically operated; rolls up into ceiling enclosure in seconds at touch of key switch.
3. No floor track.
4. The necessary sound proofing qualities of weight per square foot and density are provided by the formulation of vinyl and lead. These materials provide a "limp" mass wall of strength yet the 1/8" thickness is thin enough to be automatically rolled into a small ceiling enclosure that takes only 18 square inches of space, regardless of height or length.
5. Sideguides take only 8 1/4" x 2 1/2" of floor space on each end regardless of size.
6. Gasketed sides and top, and weighted loop at bottom of curtain assure perimeter sealing.
7. Tests by Riverbank Acoustical Laboratories to ASTM E-90-61T show 3 lb. (1/8" thickness) LeadX gives a 9 frequency transmission loss of 32 db and a sound transmission class of 34.

WRITE FOR BROCHURE INCLUDING TEST DATA, DETAILED DRAWINGS AND SPECIFICATIONS

TORJESEN INC.

1901-2016



# This is Dur-o-wal

*the masonry wall reinforcement  
with the trussed design*

Don't be misled by the common habit of calling all metal-rod reinforcement "durowal". Look for the trussed design. This distinguishes the real Dur-o-wal, insures maximum flexural strength, with all steel members effectively in tension and working together.

Impartial tests have proved that truss-designed Dur-o-wal exceeds accepted standards—increases the flexural strength of a masonry wall 71 to 261 per cent, depending on weight Dur-o-wal used, type of mortar, number of courses.

A study by the Armour Research Foundation indicates that Dur-o-wal tied walls outfunction brick-header tied walls. Write to any Dur-o-wal address below for a copy of Armour's 44-page report.



*Two engineered products that men a need. Dur-o-wal reinforcement, shown above, and Rapid Control Joint, below. This ready-made control structure flexes with the wall. Recommended by construction engineers especially for concrete block.*



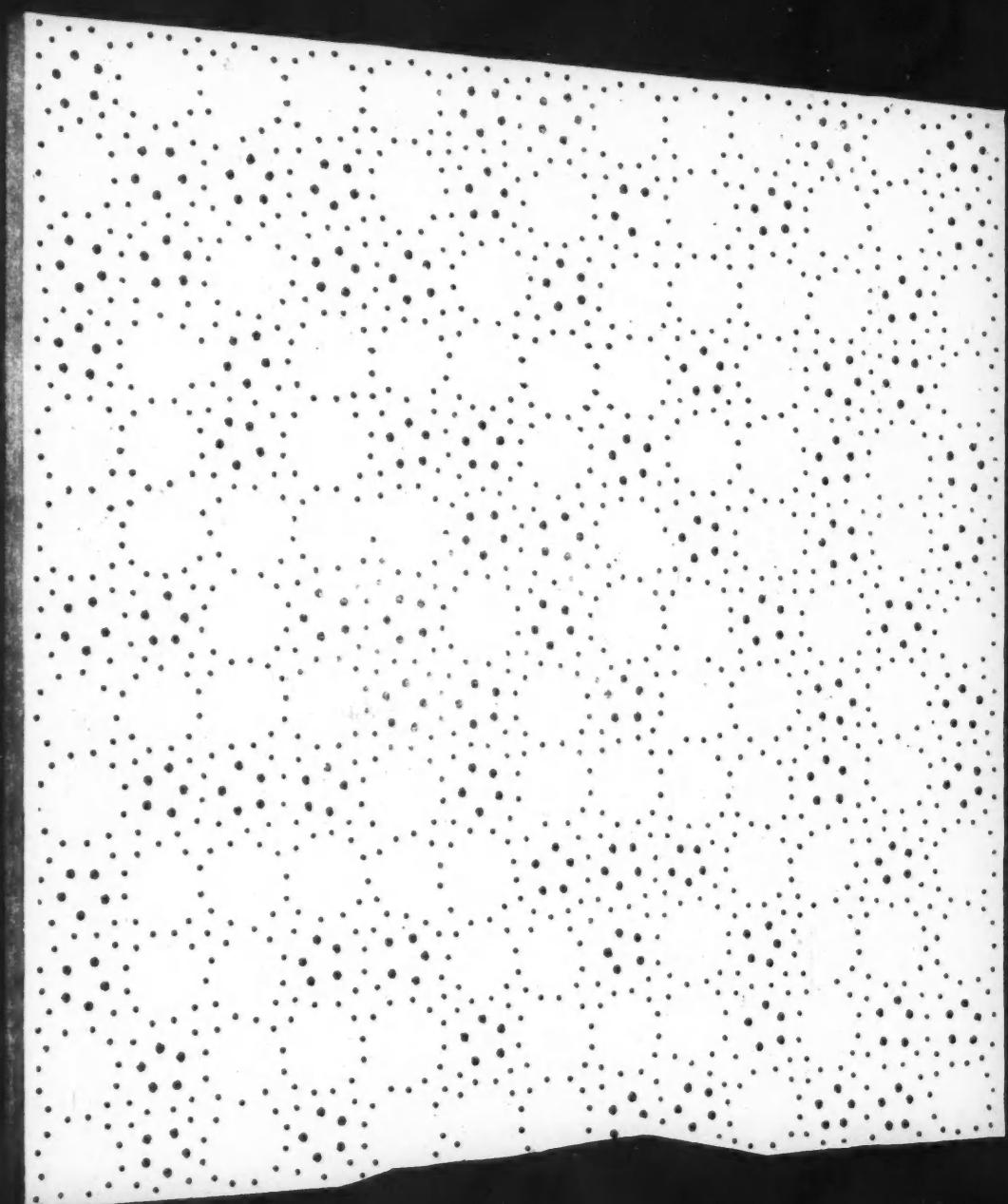
## **DUR-O-WAL**

**Masonry Wall Reinforcement and Rapid Control Joint**

**RIGID BACKBONE OF STEEL FOR EVERY MASONRY WALL**

### **DUR-O-WAL MANUFACTURING PLANTS**

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- Dur-o-wal, Prod., Inc., Box 628, SYRACUSE, N. Y.
- Dur-o-wal, Prod. of Ala., Inc., Box 5446, BIRMINGHAM, ALA.
- Dur-o-wal Div., Frontier Mfg. Co., Box 49, PHOENIX, ARIZ.
- Dur-o-wal of Colorado, 29th and Court St., PUEBLO, COLO.
- Dur-o-wal Prod., Inc., 4500 E. Lombard St., BALTIMORE, MD.
- Dur-o-wal, Inc., 1678 Norwood Ave., TOLEDO, OHIO
- Dur-o-wal of Minnesota, 2653 - 37th Ave., South, MINNEAPOLIS 8, MINNESOTA
- Dur-o-wal Ltd., 789 Woodward Avenue, HAMILTON, ONTARIO, CANADA



"a beautiful, versatile pattern!"

NEW *Tiffany*\*

Acoustical Tile by CELOTEX

Elegant Tiffany... new inspiration for the creative designer of modern functional-yet-beautiful ceilings! Interesting in detail... monolithic in effect... this exclusive new perforation pattern brings an entirely new look to ceilings.

*Tiffany*

*Tiffany*

**PROTECTONE<sup>†</sup> UL FIRE-RATED MINERAL FIBER TILE.** The PROTECTONE family of fire-retardant tiles for UL time-rated ceiling assemblies... already widely varied in texture and pattern... proudly adds Tiffany (2-hour rated; concrete deck over steel bar joints).

**INCOMBUSTIBLE MINERAL FIBER TILE**

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**ALSO IN FIBERBOARD TILE**, this exciting new pattern is available in HUSH-TONE<sup>®</sup> "Bolero," 12" x 12" and 12" x 24" sizes, with famous EZ tongue-and-groove joint.

For samples, specifications, expert Ceiling Consultation Service, call your Acousti-Celotex distributor. He's in the Yellow Pages.

\*U. S. Design Patent No. D-191,203  
†TRADEMARK

**Acousti-CELOTEX**  
SOUND CONDITIONING PRODUCTS

The Celotex Corporation  
120 S. LaSalle Street, Chicago 3, Illinois  
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Montreal, Quebec



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For cabinet doors . . . for fine furniture . . . for heavy doors

The EPCO family of Magnetic Catches are designed to meet the varied needs of the building, cabinet and furniture industry. Each features "touch" closing and secure holding power. Each is self-aligning to an enlarged strike plate and is designed to mount in diverse ways simply and quickly. Each is built to present a handsome, unobtrusive appearance and to last a lifetime.

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- Self-aligning to enlarged strikes
- Easy and quick to install
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**THE ENGINEERED PRODUCTS CO.**

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560 Magnetic cabinet catch. Heavy duty, self-aligning alnico lifetime magnet. Aluminum or copper-tone finish case.



570 Magnetic Catch for furniture. Lifetime magnet, self-aligning to cushion strike. copper-tone finish.



591 Heavy duty magnetic cabinet catch offers varied mountings. Overcome door warpage, misalignment. Aluminum case.



592 Extra heavy duty magnetic catch for heavier doors, controls door warpage. Dual action case attracts from either side.



600 Round magnetic catch press fits into  $\frac{5}{8}$ " bore in shelf or frame. Aluminum case, self-aligning to round strike.



602 Round magnetic catch press fits into  $\frac{7}{8}$ " bore in door. Aluminum case. Self-aligning to enlarged strike.



1000 Magnetic catch with plastic case, lifetime, self-aligning ceramic magnet. Universal application.



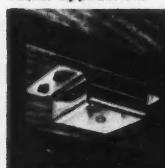
1001 Magnetic catch with plastic case, lifetime ceramic magnet, self-aligning to enlarged strike. For mounting on door.



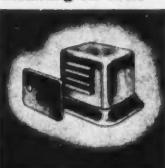
1002 Magnetic catch with plastic case, lifetime, self-aligning magnet. Mounts in a variety of ways.



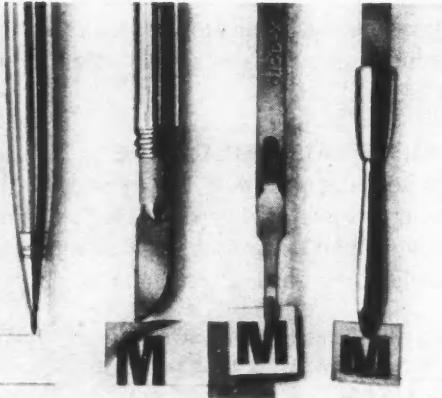
555 Snap-in Magnetic catch for metal cabinets. Spring tension holds in stamped-out opening. Self-aligning ceramic magnet.



593 Magnetic catch of extra heavy holding power to assist door closures for complete closing. Mounts in various ways.



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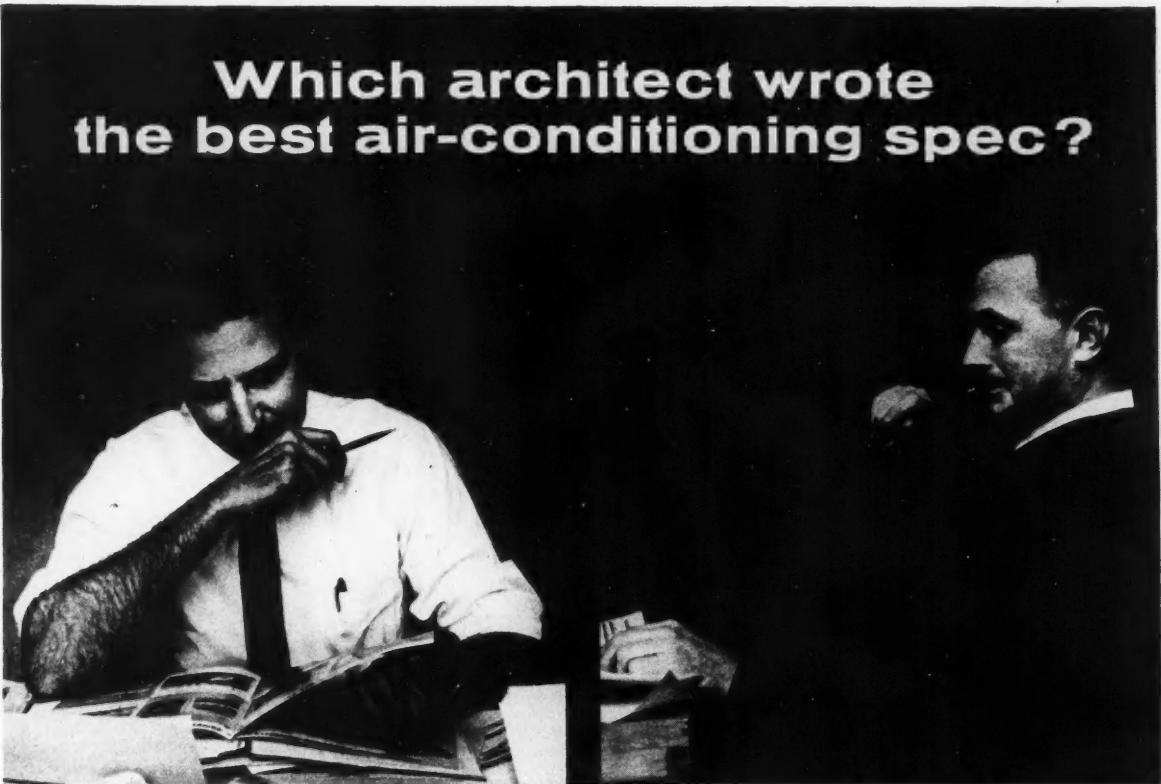
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**Here's why:** Any equipment\* bearing the ARI Seal of Certification assures the architect that the equipment will produce the cooling capacity claimed. To be granted the Seal, a manufacturer must rate his equipment in standard Btu per hour instead of the confusing and less accurate "horsepower." Qualified equipment is subject to random selection from stock for intensive checking and verification in an independent testing laboratory under adverse conditions, with emphasis on wilting heat and high humidity.

Specify *ARI-Certified* for complete assurance that the unitary equipment you require will deliver its full rated cooling capacity, and continue to deliver ample capacity under adverse conditions.

Participating manufacturers covered by the Certification program, and their unit lines, are named in a directory which is available upon request without charge from Department 0-1111.

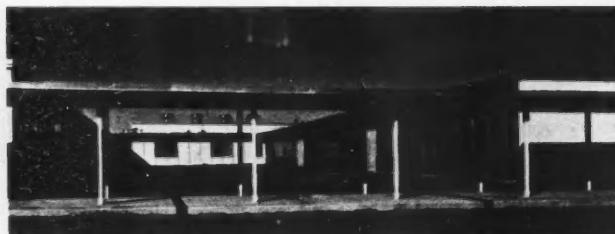
\*"Unitary" air conditioners included in this program: all packaged air conditioners, whether single units or two-piece units (called "split" systems), up to 135,000 Btuh in capacity, but not including room air conditioners. ARI Standard 210-58 for electrically-driven equipment; ARI Standard 250-58 for heat operated equipment.



**AIR-CONDITIONING AND  
REFRIGERATION INSTITUTE**  
1346 Connecticut Avenue, N.W.  
Washington, D.C.

Manufacturers participating in this program as of September 1, 1961: • A. & B. Sales • Air Conditioning, Incorporated • Airetemp Division, Chrysler Corporation • Albion Division, McGraw-Edison Company • Amana Refrigeration, Inc. • American Furnace Company • American-Standard Air Conditioning Division, American Radiator and Standard Sanitary Corporation • American-Standard Industrial Division, American Radiator and Standard Sanitary Corporation • Arklia Air Conditioning Corporation • Armstrong Furnace Company • Bryant Manufacturing Company • Carrier Air Conditioning Company • Cleveland Steel Products Corporation, Torishheet Division • Cobell Industries Incorporated • Columbia Specialty Company, Inc. • Coleman Company, Inc. • Crane Co. • Curtis Manufacturing Company • Day & Night Manufacturing Company • Fraser & Johnston Company • Friedrich Refrigerators Incorporated • Gaffers & Sattler • General Electric Company • Goettl Bros. Metal Products Inc. • Henry Furnace Company, The • Holly-General Company, Division of the Siegler Corporation • International Heater Company • International Metal Products Division, McGraw-Edison Company • Janitrol Heating and Air Conditioning, A Division of Midland-Ross Corporation • Johnson Furnace Company, The • Lennox Industries Incorporated • Lincoln Air Control Products, Inc. • Majestic Company, Inc. • Payne Company • Peerless Corporation • Perfection Division, Division of Worthington Corporation • National Thermatic Corporation • Olsen Manufacturing Company, C. A. • Payne Company • Republic Air Conditioning Co., Division of Republic-Transcon Industries, Inc. (Formerly Mathes Company, The) • Rheem Manufacturing Company • Round Oak Division of Peerless Corporation • Southwest Manufacturing Company • Stewart-Warner Corporation • Texas Products Manufacturing Company • Therm-Air Manufacturing Company • Thermo-Electronics, Inc. • Trane Company, The • Typhoon Air Conditioning Division, Hupp Corporation • United States Air Conditioning Corporation • Welbilt Air Conditioning and Heating Corp., Subsidiary of Welbilt Corporation • Westinghouse Electric Corporation • Williams Oil-O-Matic Heating Company, Division of National Union Electric Corporation • Worthington Corporation • Wright-Temp Manufacturing Company, Inc., Division of Wright Manufacturing Company • York Corporation, Subsidiary of Borg-Warner Corporation • Zink, John, Company.

# Inside...outside...the colorful look



Ray M. Hatton Elementary School, Bridge City, Texas  
Architect—Goleman & Rolfe, Orange, Texas



Dearborn Township School, Wayne County, Mich.  
Architect—Bennett & Straight, Dearborn, Mich.



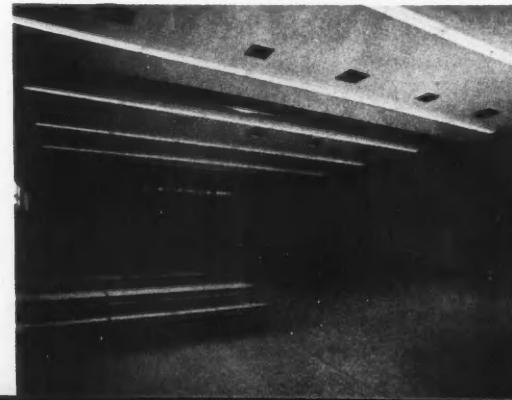
South Lyon Elementary School, South Lyon, Mich.  
Architect—W. T. Anicka & Associates, Ann Arbor, Mich.



New Intermediate School, Vestaburg, Mich.  
Architect—Warren Holmes Company, Lansing, Mich.



Central Elementary School, Warsaw, N. Y.  
Architect—Trevor Rogers, Buffalo, N. Y.



# of AmBridge Modular Construction

The architects who designed these schools all used AmBridge Modular Construction. Yet, each school has its own distinctive character because it was *individually* designed.

In a matter of a few months you can have a spacious, colorful new school designed to fit your needs and budget. AmBridge Modular School components are precision-fabricated before they reach the job site, so it takes only a handful of men to erect them. Think of the time and money that saves.

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The steel walls are less than 3" thick, yet provide unexcelled sound control and better insulation than a conventional 12" wall plus plaster. And because walls are so much thinner, they provide about 5% more floor space compared to conventional construction.

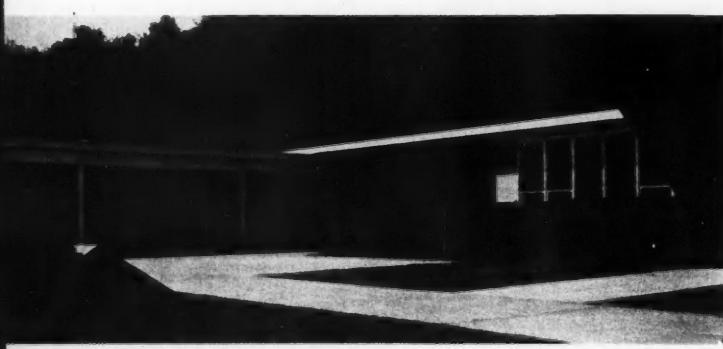
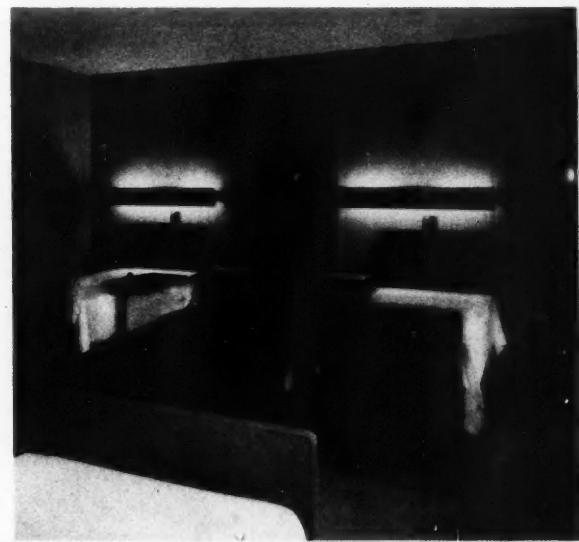
There it is. Fast construction. More space. Competitive cost. Style. If you'd like to have more information, write for our 24-page booklet. American Bridge Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

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This mark tells you a product  
is made of modern, dependable Steel.



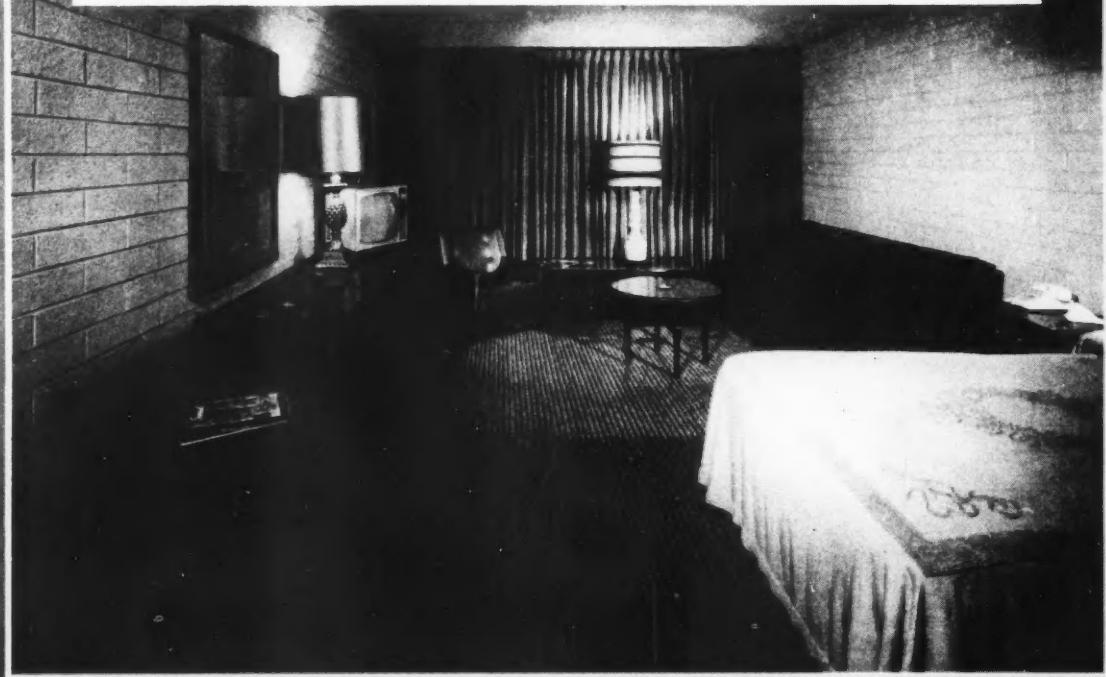
Beaver Area Senior High School, Beaver, Pa.  
Architect—B. J. McCandless, Ellwood City, Pa.

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At Tucson's Magnificent



New Executive Inn



As new as it is, the Executive Inn is fast becoming a Tucson landmark. Beautifully designed inside and out, this deluxe motor inn has every modern facility for the enjoyment of its guests. ■ Because each detail of the Executive Inn's furnishings had to reflect quality and also complement the crisp modern decor, Heywood-Wakefield's Riviera Group was selected to furnish all 137 guest rooms. Beautiful, durable and surprisingly reasonable, the Riviera Group adds brilliance to a superb motel. ■ The Executive Inn's management took advantage of the convenience offered by Heywood-Wakefield and its affiliated Contract Furnishers of America member firms and the entire transaction, including financing, was completed promptly and efficiently. ■ For complete details regarding Heywood-Wakefield's broad line of contract furniture, write Heywood-Wakefield Co., Gardner, Mass.

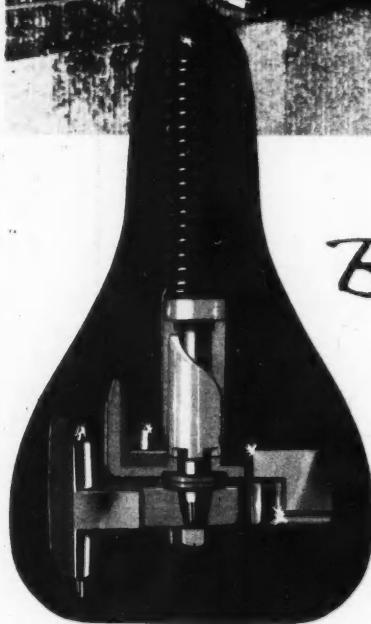
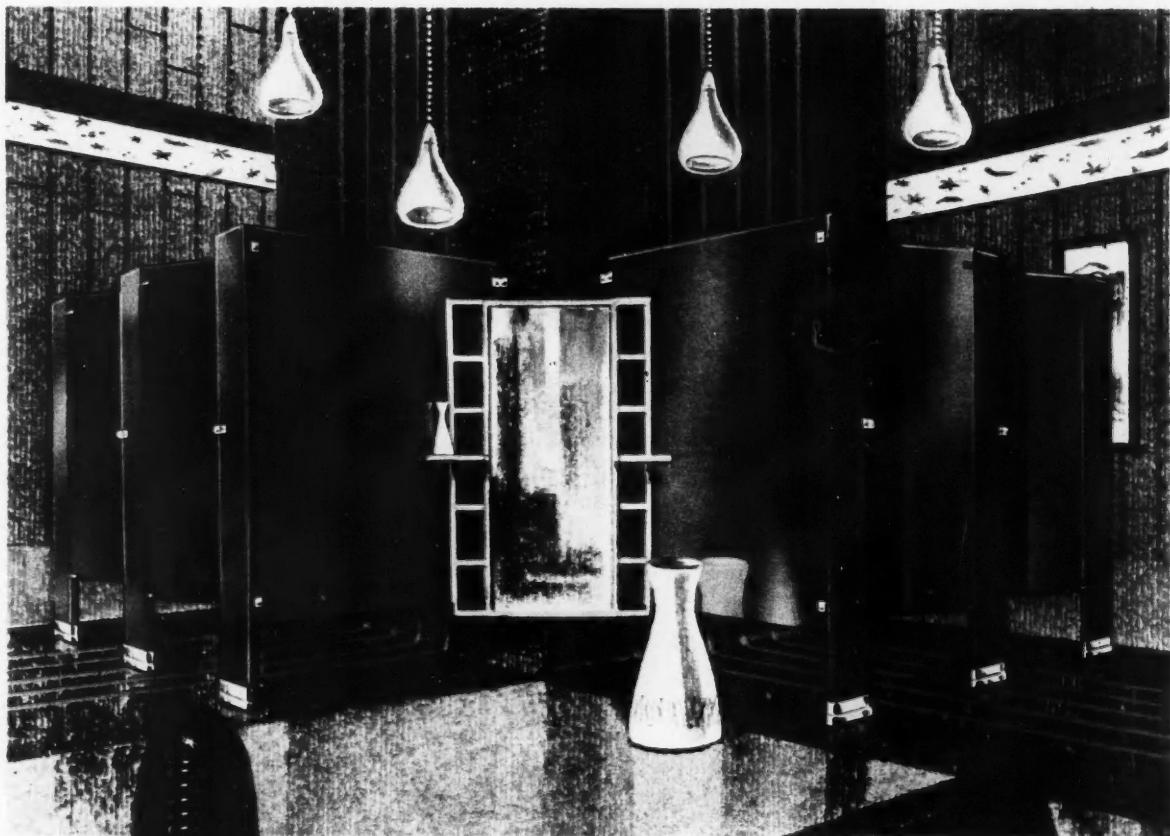
**The Riviera furniture was supplied through Revere Furniture and Equipment Co., Washington, D. C.**



All outdoor furniture was produced by the Lloyd Manufacturing Company, a Heywood-Wakefield subsidiary.

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Wholly concealed bottom hinge is engineered so that door does not rise or lower when opened. Weight of door is fully supported on Zytel bearing, not on cam... a million test openings without wear. Opposing journalized Zytel cam units assure accurate and positive pre-selected door positioning.



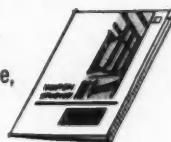
Nameplate identifies every compartment

## EXCLUSIVE ENGINEERING OF *Bottom* HINGE MEANS *Top* PERFORMANCE

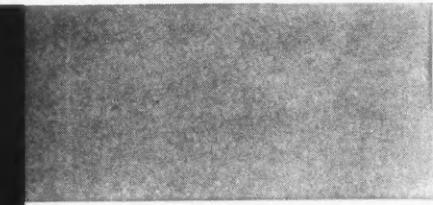
Why is a hinge so important? Simply because no other compartment component gets as much wear. Door hinges are the real key to long life and low maintenance.

Sanymetal hinges are fully recessed and flush to facilitate cleaning, factory installed for economical compartment installation, engineered for exceptionally long tamper-proof life and along with Sanymetal's integral hinge brackets present the most beautiful appearance.

These are the reasons for Sanymetal's highest quality at lowest in-place cost. If you would like the new imaginative, full-color "Design Studies" just call your Sanymetal representative or write direct.



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Spend \$300,000 for a new laundry, when the *real need* was expanded and improved facilities for patient care? This was the problem facing Pittsburgh's St. Francis Hospital in enlarging its capacity to 740 beds. The solution was found in linen supply service. Thus, the funds otherwise required for a new laundry were utilized to expand and improve direct patient care.

Now, St. Francis Hospital leases some 80 different linens, garments and other cotton goods. These items

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Check your local linen supplier to find out how much better hospitals and other institutions you design can operate with linen supply, and how much more planning freedom such service gives you. You'll find the name of your linen supplier listed in the Yellow Pages under "Linen Supply" or "Towel Supply."

## ARCHITECTS

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# Linen Supply

Association of America

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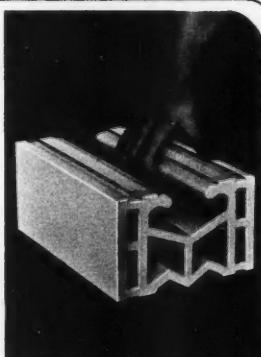
The National Biscuit Company's Fair Lawn, N.J., plant, showing exterior walls of Natco Dri-Speedwall tile.

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26,624,850 lbs. Natco  
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Modern architectural  
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Nominal face size 5 1/2" x 12"

Almost 30 million pounds of Natco structural clay tile products went into the construction of Nabisco's new Fair Lawn, New Jersey bakery.

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*Today's idea becomes tomorrow's showplace...when Natco structural clay products are in the picture*

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Constructed of high quality steel, Geneva cabinets retain their original beauty longer—require minimum attention.

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Section of teachers demonstration center in food laboratory.

**Geneva**

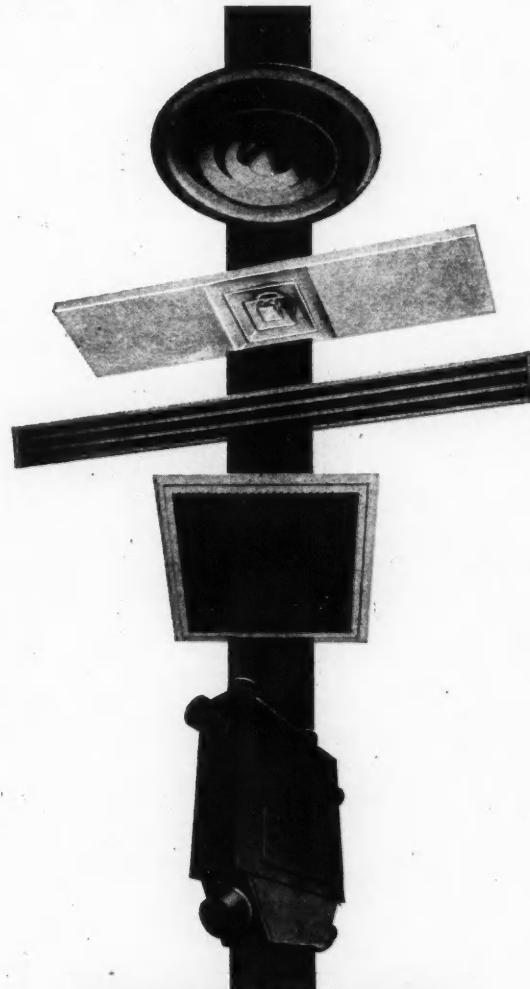
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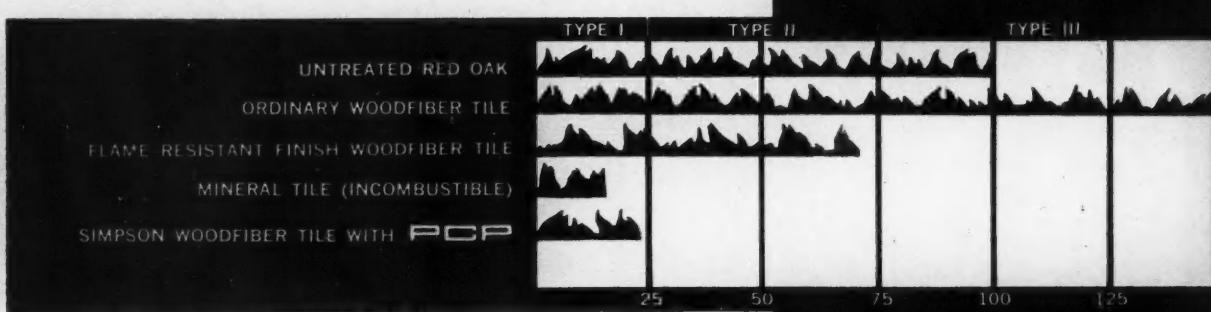
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Fiberglas Engineering & Supply



The label shown below appears on every carton of PCP acoustical material. It is your assurance that PCP is produced under the label and inspection service of Underwriters' Laboratories, Inc.

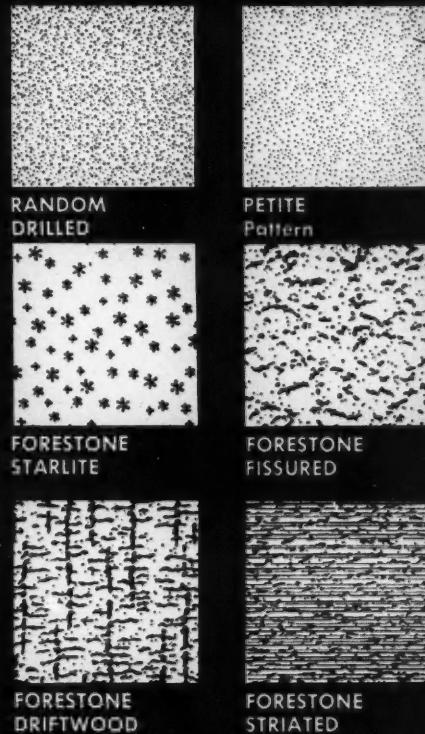


Now, on your very next job, you can specify Simpson woodfiber tile containing amazing PCP—and get Type 1 flame spread safety with up to  $\frac{1}{3}$  savings on material cost. PCP (Pyro-Chem Protection)—another revolutionary new product from the Simpson research laboratories—is a unique process that gives Simpson woodfiber tile a flame spread rating equal to that of far more costly, highest quality mineral tile.

PCP performance was confirmed in the Flame Tunnel Test, results of which are shown above. Note the almost indistinguishable difference between Forestone with PCP (bottom line) and mineral tile (second from bottom).

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Pyro-Chem Protected woodfiber tile	Flame-resistant finish woodfiber tile*	Mineral tile (incombustible)
Flame Spread 3-23	60-70	5-15
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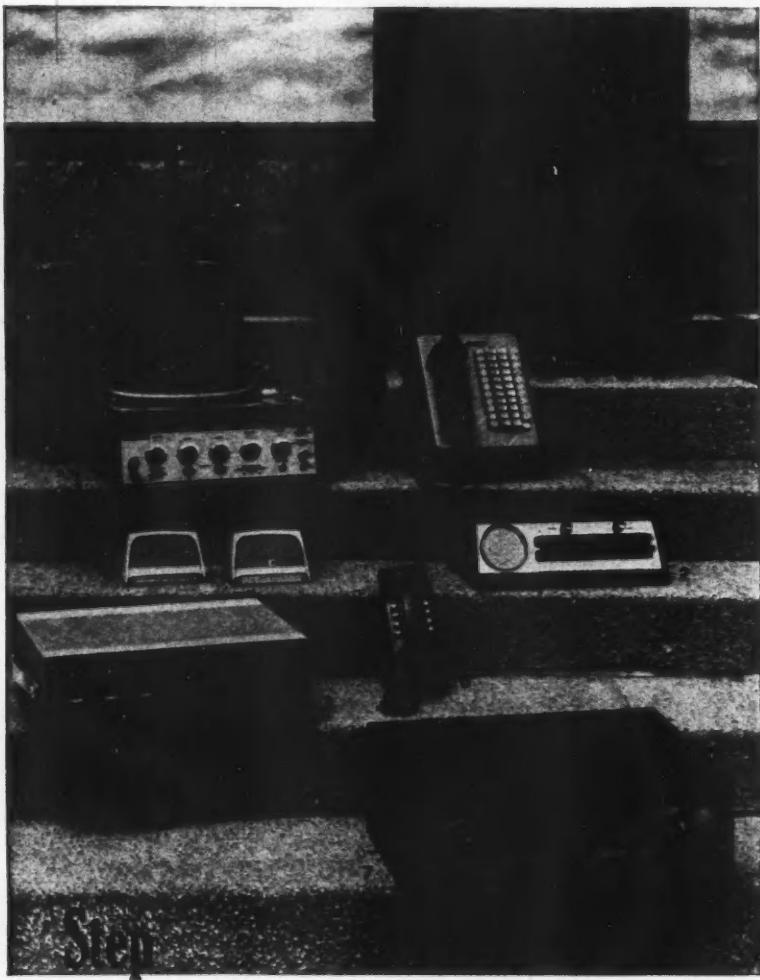
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61-6

*The Record Reports*  
continued from page 94

solar devices, partitioning), free experimentation and use of color, Mr. Parkin concluded that in the completion of industrial parks such as Annacis Island or Don Mills, Canadian architecture has realized one of its most important achievements. "The lesson to be learned . . . is . . . that it is in the successful grouping of buildings into a harmonious whole that we can find an ideal worthy of our most conscientious striving . . . I personally believe that our industrial parks are the first important step in a progressive movement to extract order out of the urban environment."

In the role of interrogators were Charles R. Colbert, dean, School of Architecture, Columbia University, and Robert W. McLaughlin, F.A.I.A., director, School of Architecture, Princeton University.

Answering Dean Colbert's question as to why Canada used predominantly steel, Mexico concrete, Mr. Parkin replied that continuous operation all year round, with Canada's cold winter months, inhibited the use of concrete, and that Canada's big steel companies were aggressive. Mr. Candela explained that there were not many steel mills in Mexico partly since the "Spanish countries have always had a tendency to resist the technological age," that concrete was cheap and available, and that he used concrete because "I wanted to build shells."

Architects and/or Engineers?

A discussion followed Dean McLaughlin's question: "How do practices differ, as far as the collaboration of architects and engineers is concerned?" in which Mr. Parkin declared, "The integration of engineering and architecture is the only way good architecture can come about." Dean Colbert intervened, "When you see architects and engineers assembled, you see mediocrity. One of them is a kept man!" This drew the following reply from Mr. Parkin, "I do not believe people working in collaboration, particularly when they have an interest in the firm, are necessarily inferior . . ." He stated that in his firm both engineers and architects were there in the fundamental shap-

continued on page 248

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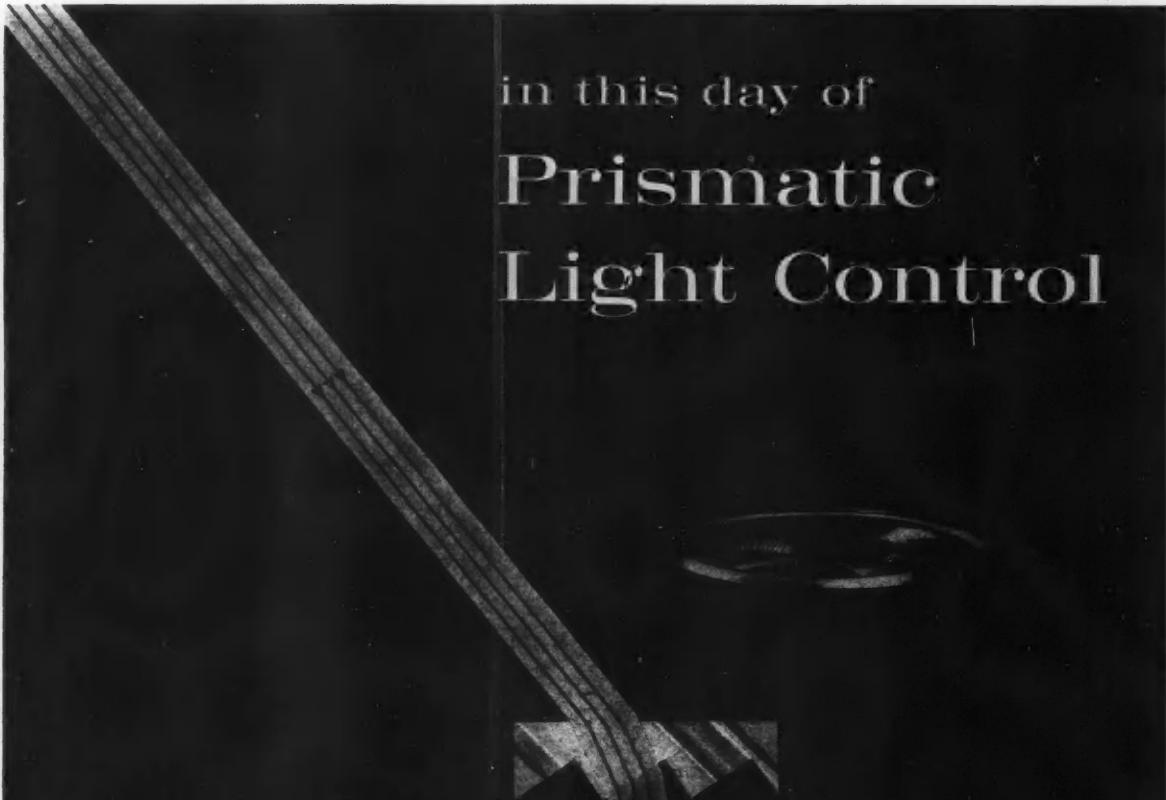
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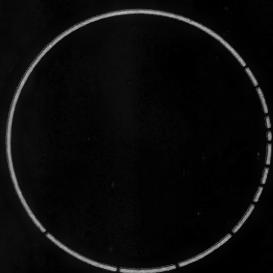
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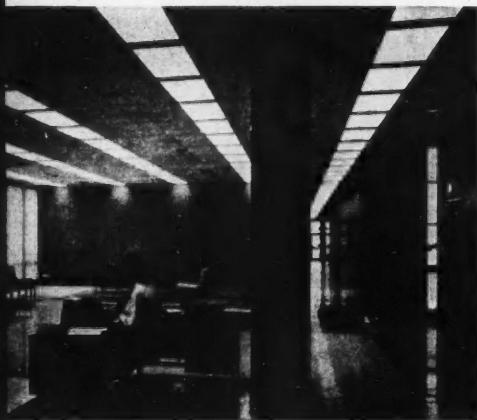
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CRAFTSMANSHIP  
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The new \$7.5 million Washington Water Power Company Service Center in Spokane, nerve center for a 26,000 square-mile area, serves public as well as Company interests. It has been hailed by Spokane's Mayor as an "inspiration" to local industries in civic beautification. Besides the park-like setting created by the project, an acoustically designed 300-seat auditorium is available to the public.

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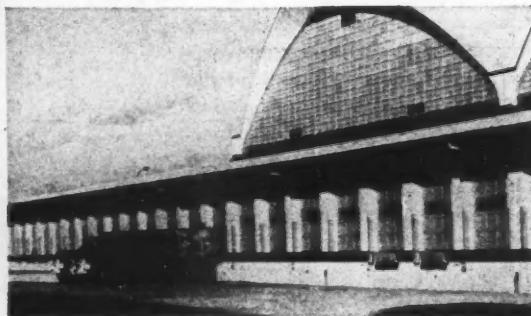
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"OVERHEAD DOORS" that open and close *automatically* complete the new automated post office in Providence, R. I., shown above and at left. "OVERHEAD DOORS," equipped with explosion-proof electrical operators, integrate with the modern electronic design to insure safer, more efficient handling of mail. Altogether, 59 "OVERHEAD DOORS" are used.

In many applications—especially with the present trend to automation—automatically operated "OVERHEAD DOORS" can help you plan for more efficient movement of materials and vehicles to save time, motion and heat loss. The doors can be operated electrically with a switch, button or pull cord placed at any point inside or outside a building. Or they can be operated electronically with a radio signal from the vehicle, to provide the convenience and flexibility of remote control.



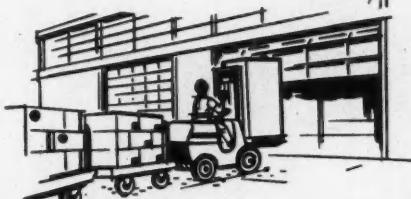
**Architect-Engineer: Charles A. Maguire Associates, Providence**

## **a new door to electronic control**

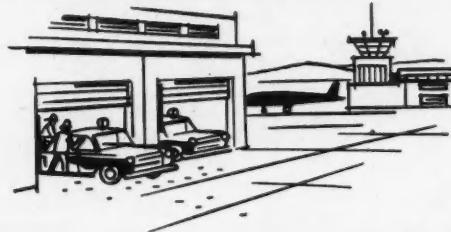
Used on exterior doors, they allow trucks to enter without delay and without exposing the driver to weather—or to possible theft or attack. Used on interior doors, they help automate materials handling systems.

Many new ideas in the use of "OVERHEAD DOORS" for electronic control have been developed by Overhead Door Corporation engineers—ideas that result from this company's 40 years' experience in the industrial door field. For an application you may be planning, get detailed information from your local distributor (see "OVERHEAD DOOR" in the white pages of your phone book), or write to Overhead Door Corporation. *General Office: Hartford City, Indiana. Manufacturing Distributors: Dallas, Texas; Portland, Oregon; Cortland, New York; Hillside, New Jersey; Lewistown, Pennsylvania; Nashua, New Hampshire. In Canada: Oakville, Ontario.*

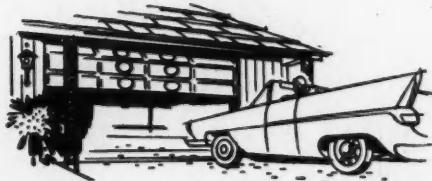
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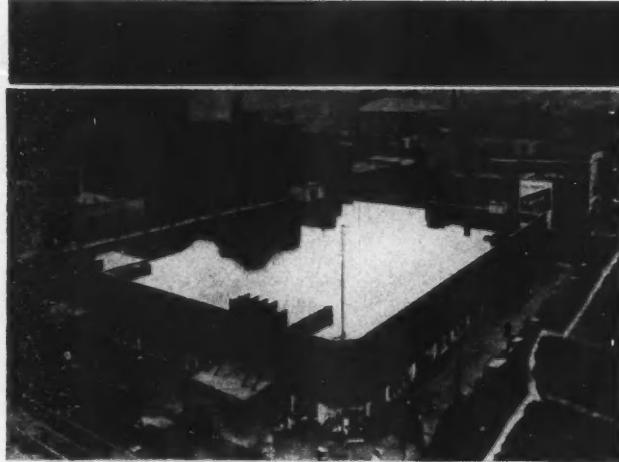
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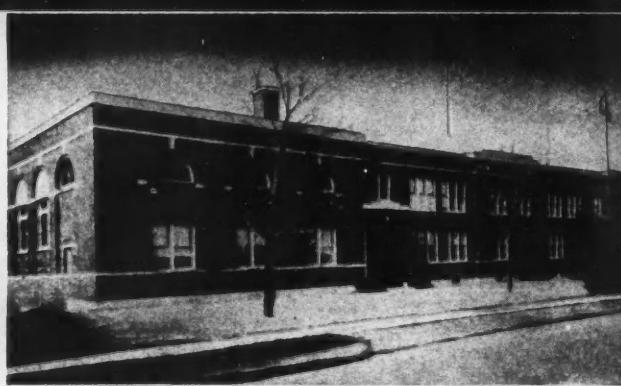
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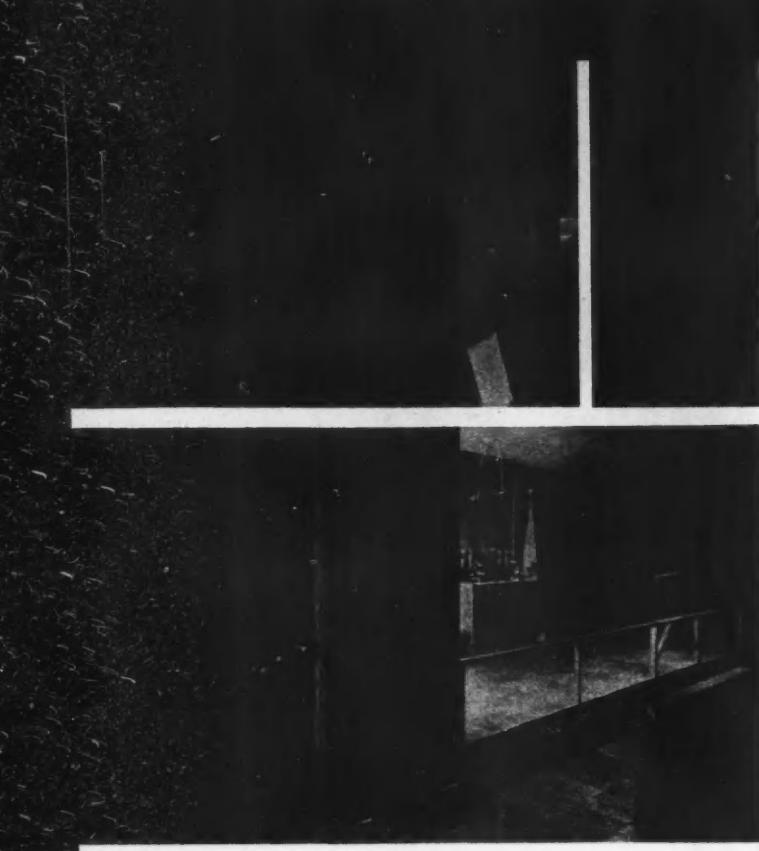
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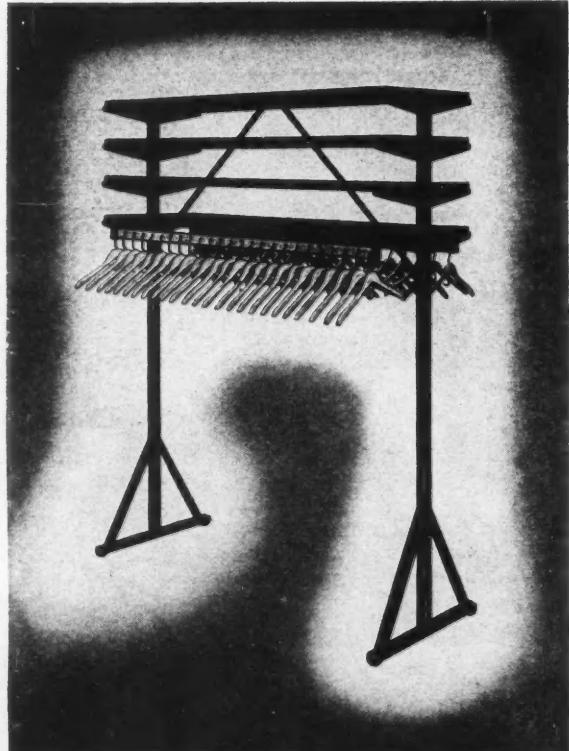
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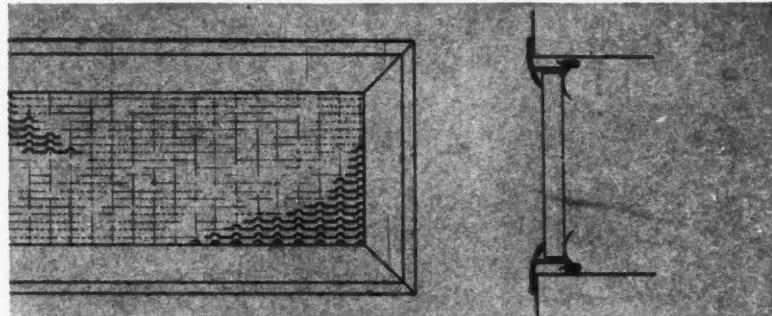
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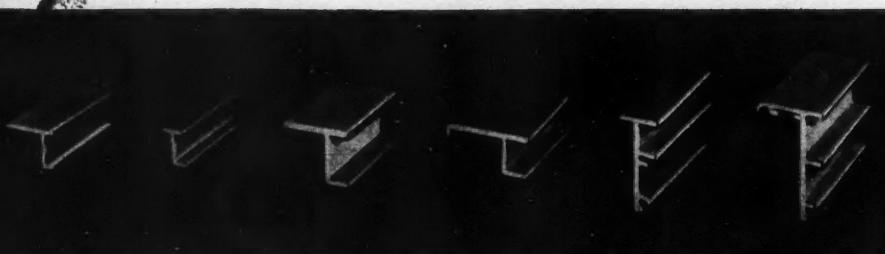
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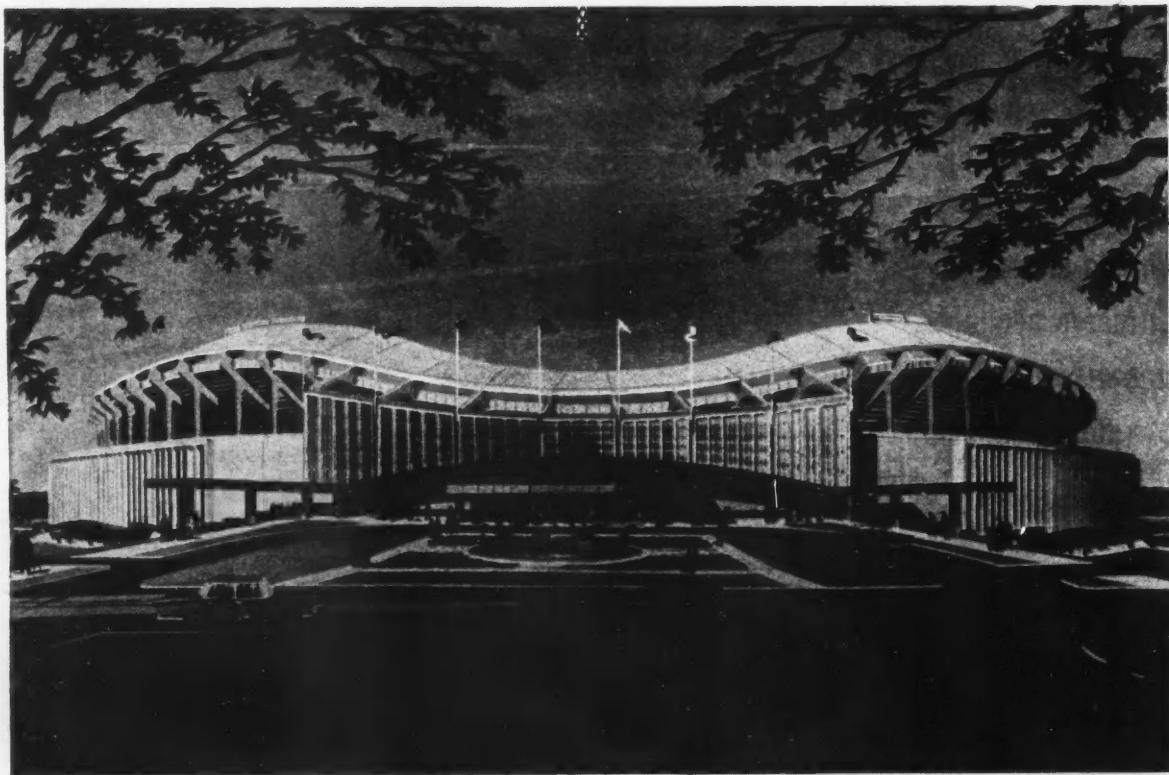
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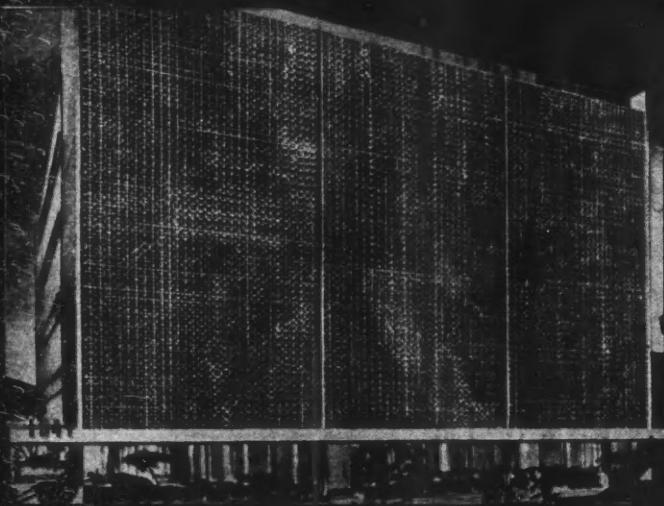


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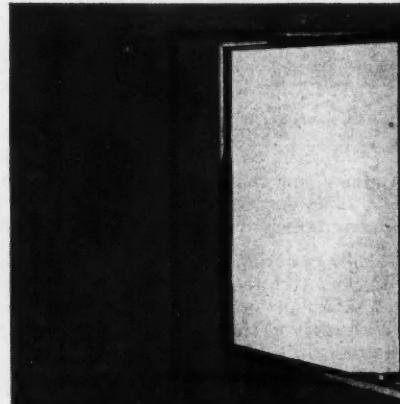
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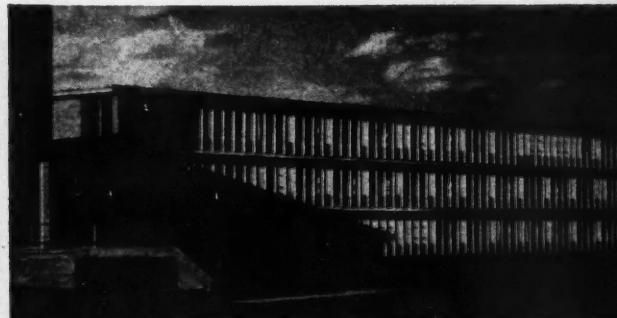
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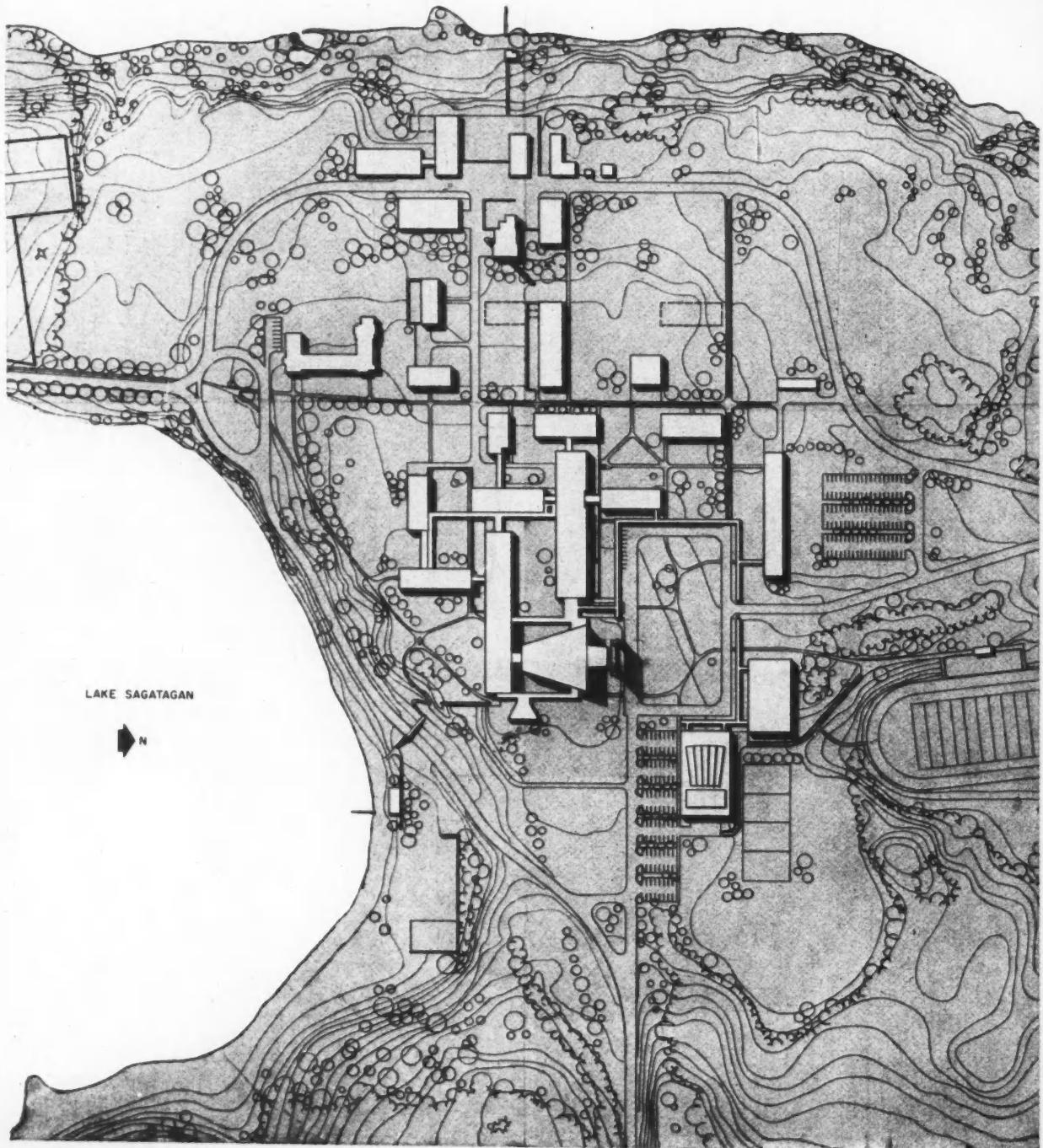
Student Dormitory, University of Miami, Miami, Florida. Architect: Robert M. Little, F.A.I.A., Miami. General Contractor: M. R. Harrison Construction Company, Miami. Painting Contractor: A. Petri, Miami.

ARCHITECTURAL RECORD  
NOVEMBER 1961



# SAINT JOHN'S ABBEY BY BREUER

ARCHITECTURAL RECORD November 1961 131



Located on 2500 acres in the rolling, wooded lake country 80 miles northwest of Minneapolis, the community of St. John's Abbey was founded in 1856 by five Benedictines. They came to establish, as St. Benedict wrote in his *Rule*, "a school of the Lord's service" to nurture the surrounding parishes and do missionary work among the Chippewa Indians. The growth of St. John's physical plant over a 100-year period was more or less haphazard, without the benefit of master plan. As architect Breuer's comprehensive scheme (above and at right) shows, the old buildings will gradually be replaced during the next 100 years within the discipline of an over-all concept.



# A Master Plan for the Next 100 Years

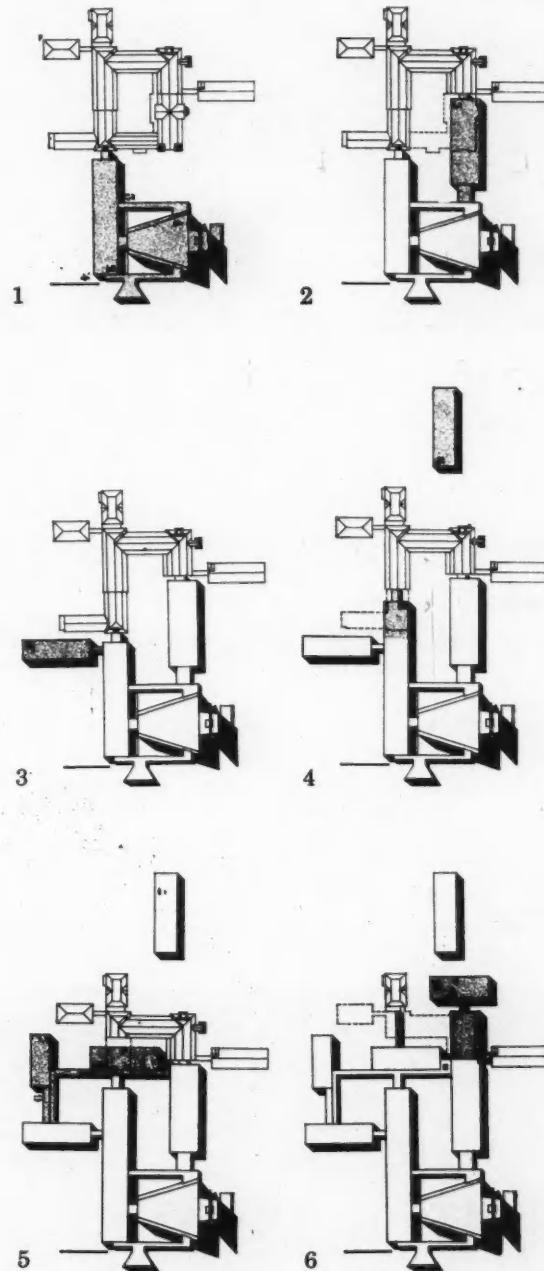
*With the church, monastery, and dormitory completed, and drawings for the library ready, the building program at St. John's enters its second phase*

The program for the master plan of Saint John's Abbey is based upon the idea of containment rather than expansion; a program aimed to provide the members of the community the facilities they need in order to become more effective in their work. Thus, architect Breuer devised a system of "shadow building" in which a new building is constructed next to—or in the shadow of—the one to be demolished; the second new building then replaces the one demolished, superseding the one to be torn down next, and so on. In this manner, old buildings are replaced painlessly, while the functioning of the monastic community suffers minimum disturbance.

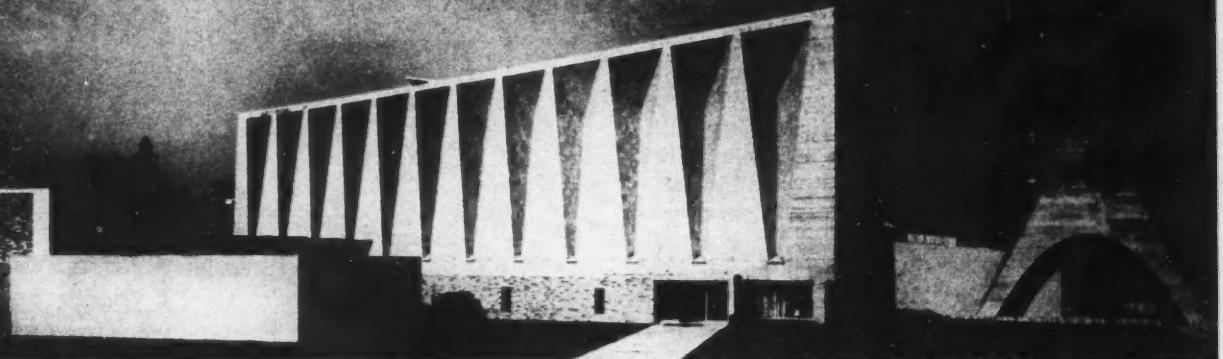
Breuer's plan was developed after exhaustive study of the workings and ideals of the community, and is conceived to be carried out in stages over a one hundred year period. Its 19 buildings will house a Benedictine monastery of 500 (300 in residence)—the largest in the world; as well as a seminary, university, and high school—total student enrollment of 2,700. The entire complex will, of course, center on and revolve about the abbey church, which will seat a congregation of 1,580 in addition to the choir of 260 priests, clerics, and brothers. The bell-shaped church building visually dominates the scene—appropriately enough—by its size and height; its bell banner rising 112 ft to make a landmark visible for miles in the surrounding countryside.

The plan clearly separates and defines claustral and scholastic zones, which come together at the church, which in turn faces upon a large, open green at the center of the plan. Connected to the south—or monastic—end of the church, the monastery faces across a south slope to Lake Sagatagan. The next two claustral units face the lake (moving toward the top of the plan) and are, respectively, the monastic seminary and the diocesan seminary. The scholastic buildings—high school and college—are grouped to the north and west (top and right) of the public green, while shops and agricultural buildings are grouped at the top (west extremity) of the plan. The administration building (next to the church), library, and auditorium complete the grouping about the central green.

In traditional fashion, the units in the central portion of the plan will be connected by covered walkways, which will variously define or enclose outdoor spaces and gardens. The different kinds of outdoor spaces between buildings—wholly or partly defined, varied in scale and form—are the key to the character of the plan. The pattern of interlocking and separated forms sets up an appealing rhythmic esthetic for the whole.



SIX STAGES, CENTRAL GROUP: 1—Church and monastic wing (now completed); 2—Administration Center (after razing old church); 3—New monastic wing; 4—High school dormitory for 220 students; 5—Classrooms and monastic seminary; 6—Science Hall and classrooms



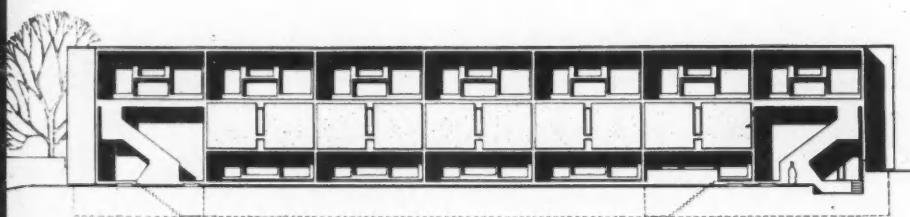
1. MONASTIC WING

2. CHAPTER HOUSE

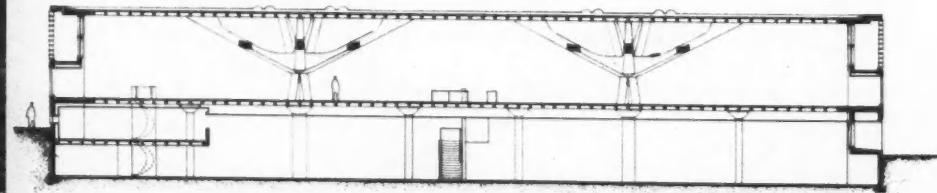
3. ABBEY CHURCH

4. BAPTISTRY

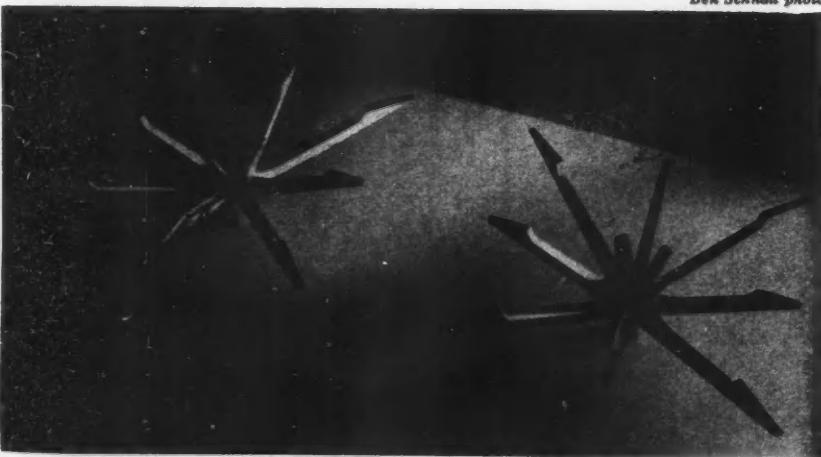
5. BELL BANNER



SOUTH ELEVATION OF LIBRARY



CROSS SECTION OF LIBRARY



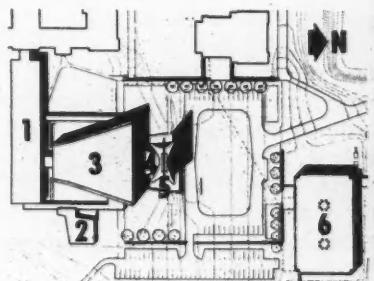
6. LIBRARY

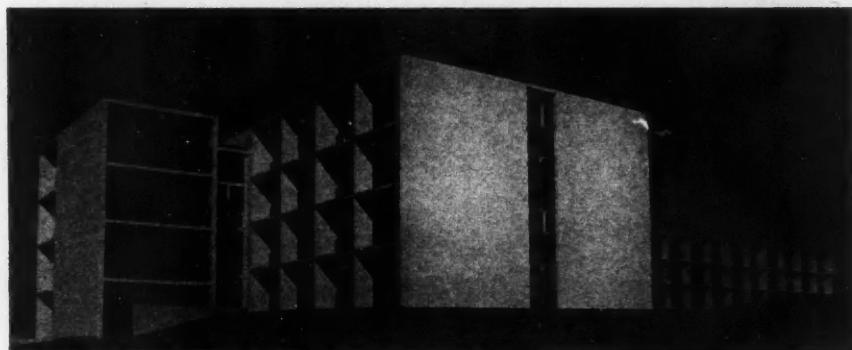
*Ben Schnall photo*

The photo above shows, in comprehensive fashion, the completed monastic wing, chapter house, church, baptistry, and bell tower; the plan below explains how they relate to each other and to the public green and parking area. The university library (6) will be built diagonally across the green

THE UNIVERSITY LIBRARY, next unit in the program to be built, will feature an interesting main reading room and open stack area at second floor level. This room will be sheltered by a deeply coffered concrete waffle-grid slab, 204 by 124 ft, which will be carried on only two interior "trees" of concrete, each of which will branch out in organic fashion to provide eight points of support. Piers around the perimeter longitudinally normal to the façades will provide lateral bracing

THE STUDENT DORMITORY, shown at right, has a design character in keeping with the monastery wing. Its concrete floor and roof slabs are supported by concrete block bearing walls. Both slabs and walls extend beyond the plane of enclosure to provide horizontal and vertical sunshading, and in so doing, build up a strong chiaroscuro pattern



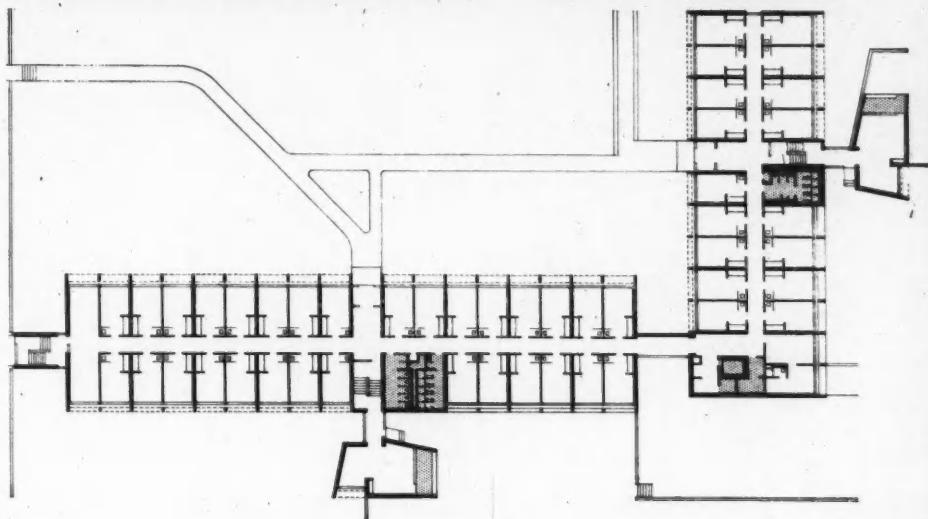


All photos (except one) by Shin Koyama

#### STUDENT DORMITORY:

*Marcel Breuer, Architect;  
Hamilton Smith, Associate*

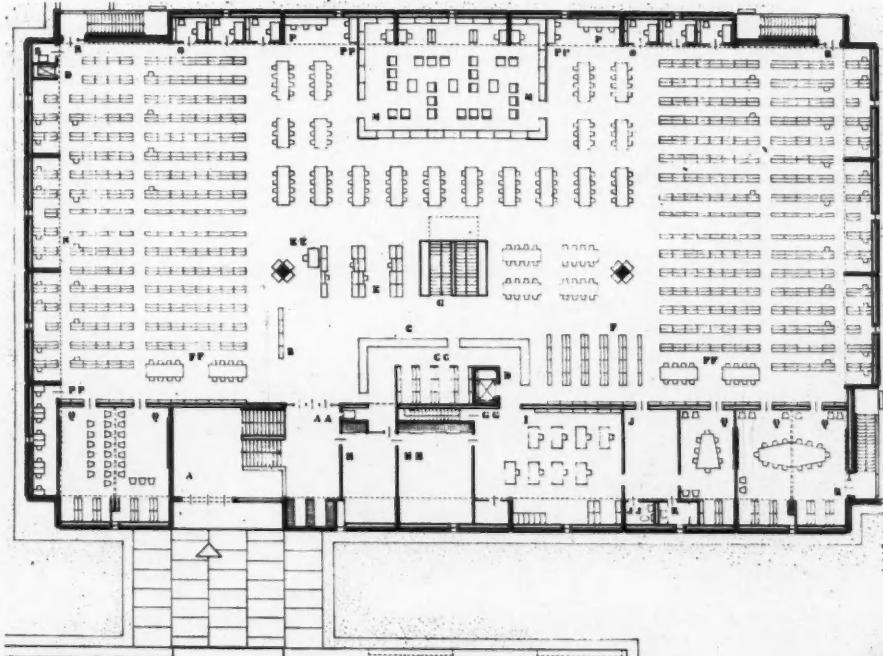
*Weisenfeld, Hayward & Leon,  
Structural Engineers; Gausman  
& Moore, Mechanical  
Engineers; Val Michelson, Field Su-  
pervision; Maurice Mandel,  
Contractor*

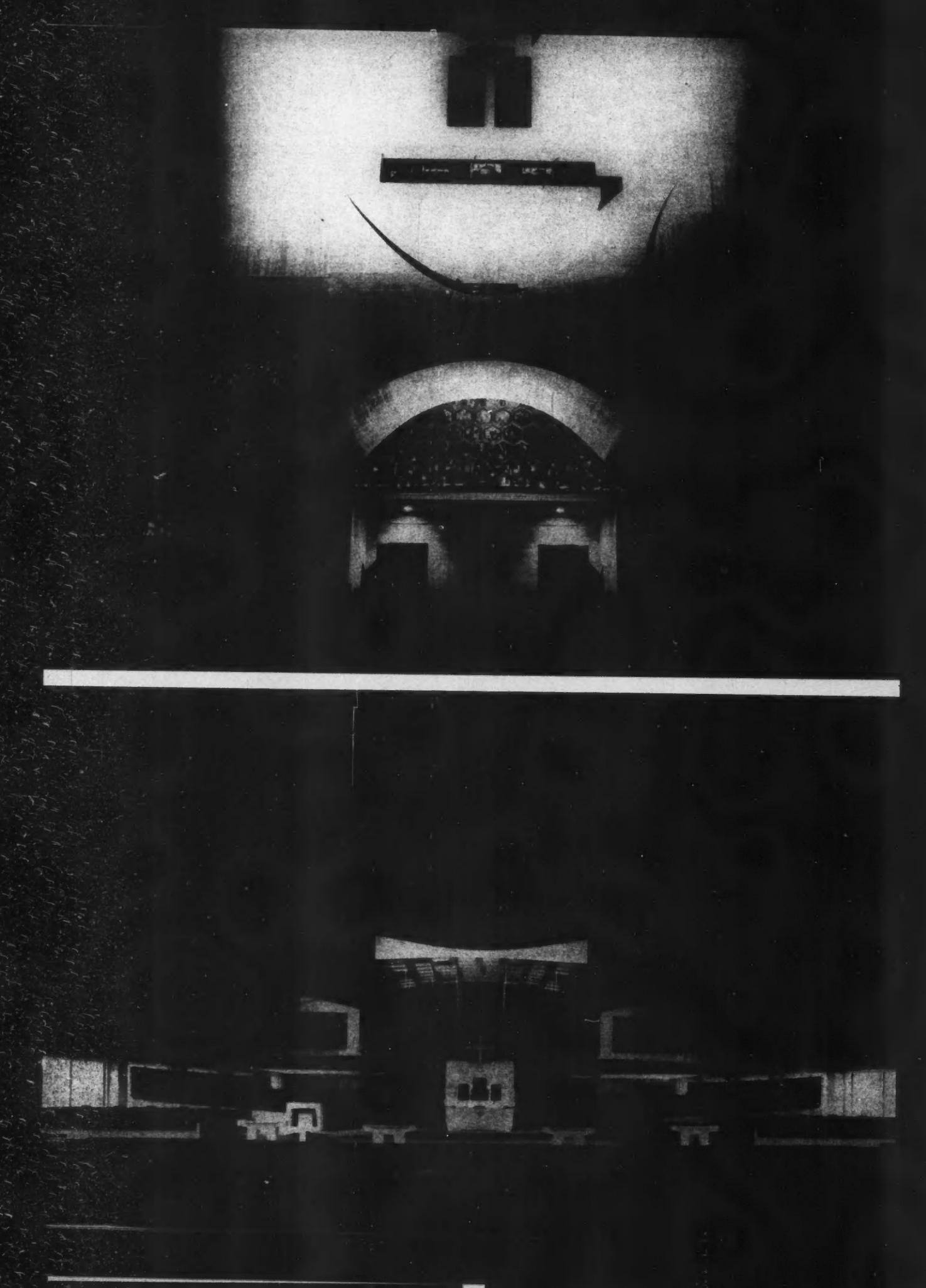


#### LIBRARY PROJECT:

*Marcel Breuer, Architect;  
Hamilton Smith, Associate*

*Johnson-Sahlman, Structural  
Engineers; Paul Weidlinger,  
Structural Theory Consultant;  
Gausman & Moore, Mechanical  
Engineers; Sidney K. Wolf,  
Acoustical Consultant*





**NINE IDEAS SHAPED THIS CHURCH:** three—liturgical in nature—proposed by the monks as important in their use of the church, determined the *plan*; three—architectural in nature—stemmed from Breuer and determined the church's *form*; and three—less tangible in nature—held by both, which determined the *character* of the church.

The monks proposed that the altar should be free-standing and centrally located, so the entire congregation of 1580—as well as the choir—would be as close to the sanctuary as possible. This idea also led to the provision of a cantilevered balcony as preferable to a lengthened nave. The monks' second request was that their choir be visible to the congregation and divided into two facing halves; a felicitous arrangement for Benedictine plain song. Third, the monks recommended—for liturgical, symbolic, and visual reasons—that baptistry, church door, confessionals, communion tables, altar, and abbot's throne be placed in sequence along a central axis. This idea set the general arrangement and also resulted in the creation of the low baptistry-atrium structure as entrance. This unit could not be left open to the sky in Early Christian tradition, due to the Minnesota climate, but contains skylights to open it upwards.

Breuer felt that structure should make a dominant visual statement, both exterior and interior; and that this statement should be contemporary in nature. Thus, the concrete folded plate construction for walls and roof, in which the longest of the continuous folds spans 135 ft, is 15 ft deep, and varies from 6 to 8 in. in thickness. The second architectural idea was that the interior church space should extend outward to include confined, controlled outdoor space. The wall construction was therefore brought down on buttress-piers so the church space could flow out between them to the cloister gardens. Third, the bell banner was created as symbol, as monumental gateway, and as a light reflector for the north wall of stained glass. The banner—an up-ended cantilever slab pierced for cross and bells—makes a poignant symbol in today's architectural idiom which is peculiarly appropriate for the Benedictines, a forward looking order.

The basic optimism and positive attitude of the monks underline the first shared idea; that the new church should be of a form valid for the future, and expressive of contemporary technology. Breuer agreed also with monastic tradition in the next idea; that enduring, non-pretentious materials should be used. The untreated concrete, brick, granite, and dark oak woodwork seem expressive of the austerity, humility, and continence of monastic life. The third common idea came from Breuer's feeling that the special devotional quality of a space is enhanced greatly, both in dignity and solemnity, by generous scale. St. John's encloses a volume greater than a million cu ft, and its amplitude is a measure of its success as architecture.



The bell banner surmounts the baptistry



Chapter house, covered walk, and church



The monastic wing joins the church to the south

#### THE ABBEY CHURCH:

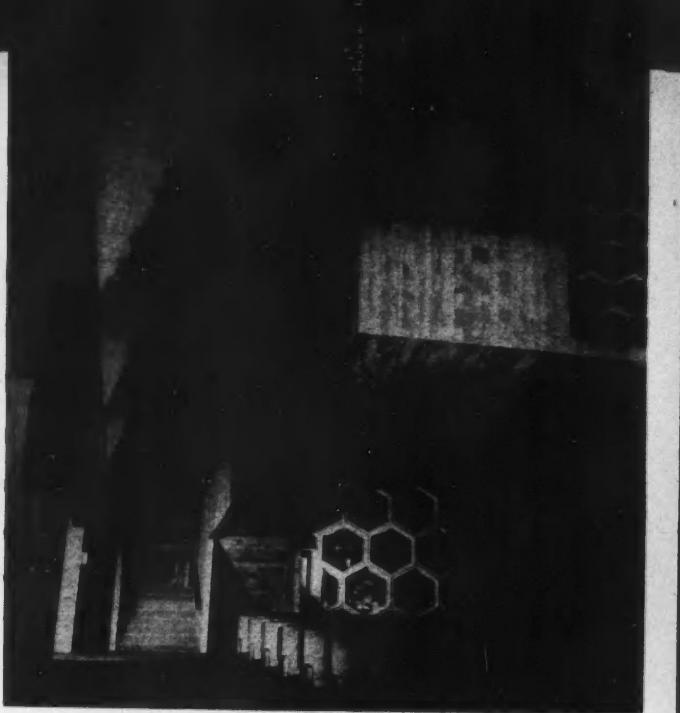
*Marcel Breuer, Architect; Hamilton Smith, Associate*

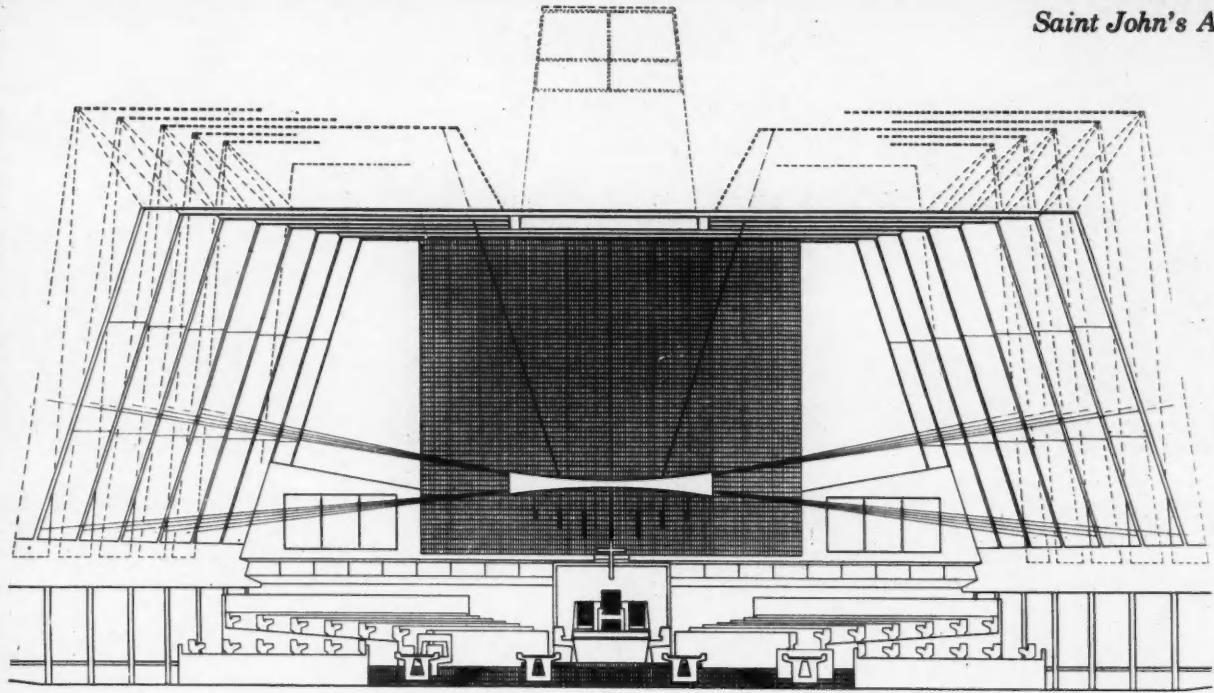
*Weisenfeld, Hayward & Leon, Structural Engineers; Pier Luigi Nervi, Structural Consultant; Gausman & Moore, Mechanical Engineers; Stanley McCandless, Lighting Consultant; Sidney K. Wolf, Acoustical Consultant; Holtkamp Organ Co., Organ Consultant; Traynor & Hermanson, Architects—Owner's Coordinator; Val Michelson, Field Supervision; McGough Construction Co., General Contractor*

#### THE MONASTIC WING:

*Marcel Breuer, Architect; Hamilton Smith, Associate*

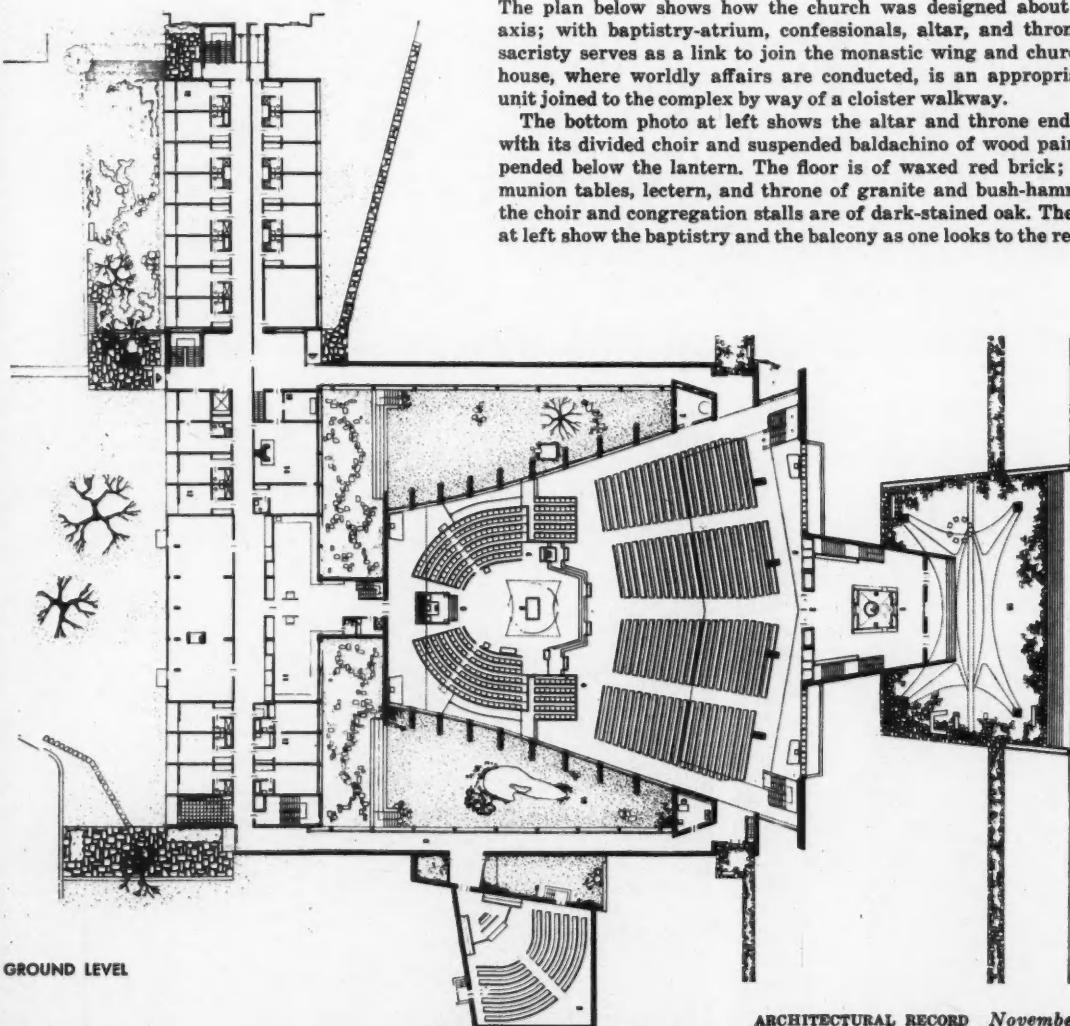
*Farkas & Barron, Structural Engineers; Fred S. Dubin Associates, Mechanical Engineers; Sidney K. Wolf, Acoustical Consultant; Traynor & Hermanson, Architects—Local Supervision; Wahl Construction Co., General Contractor*

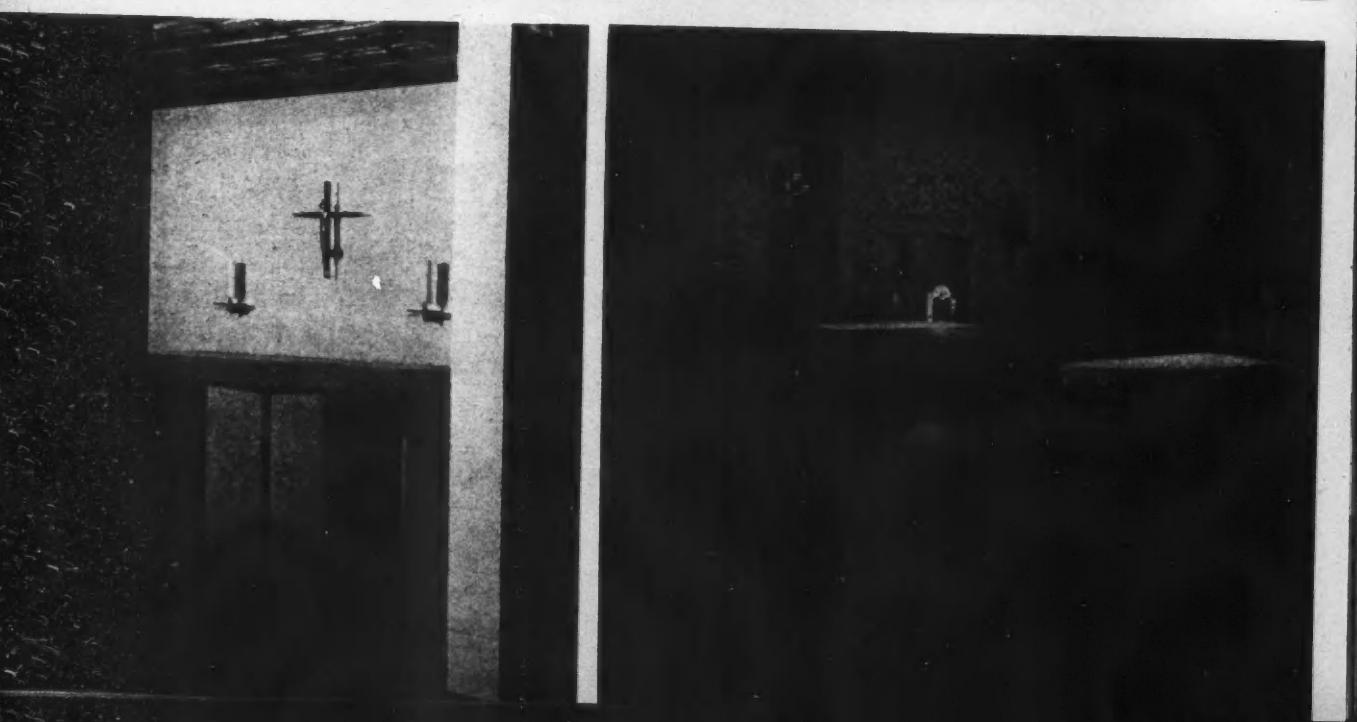
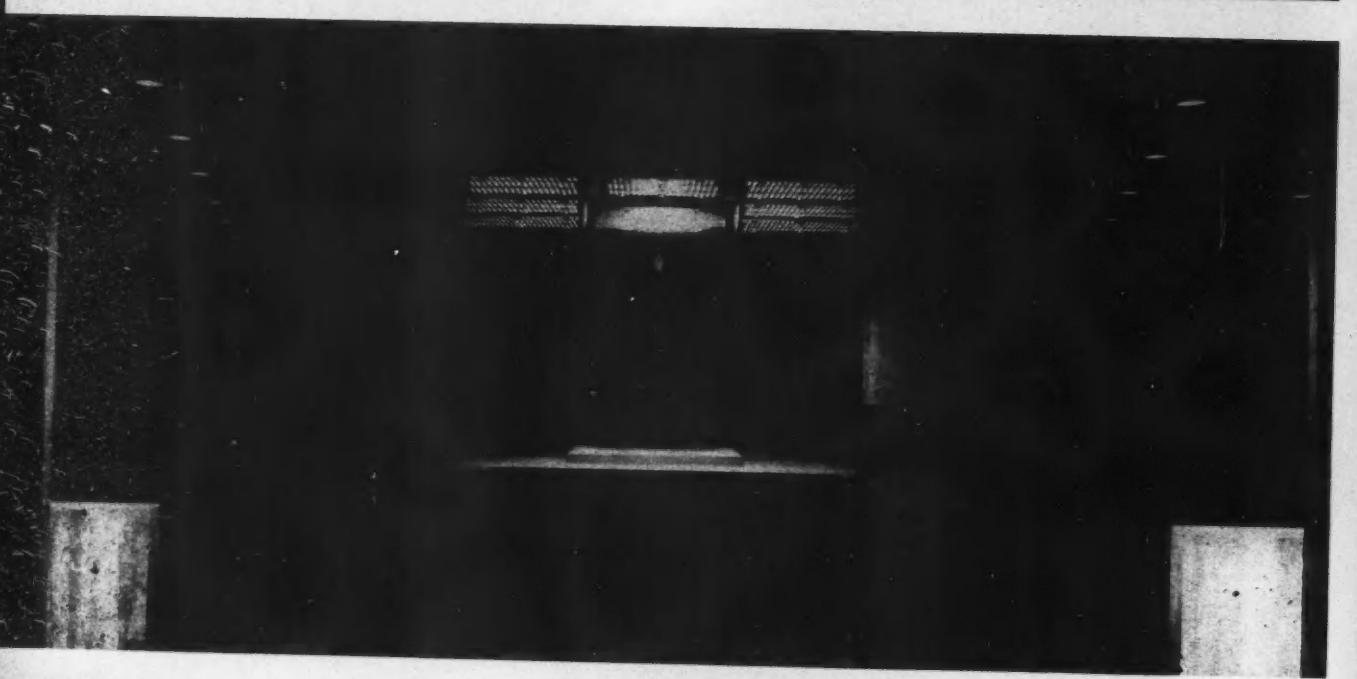
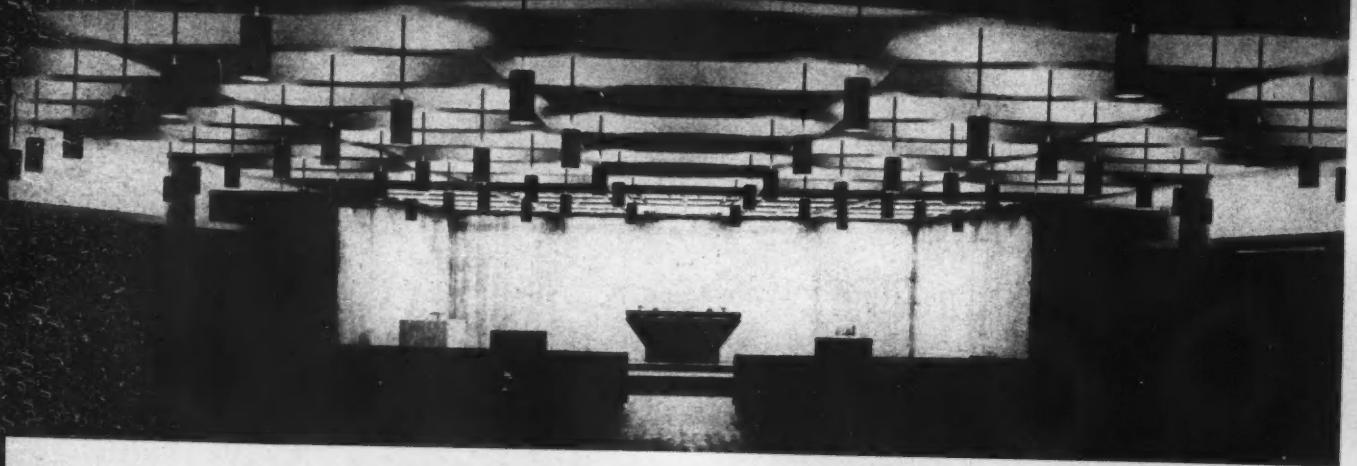


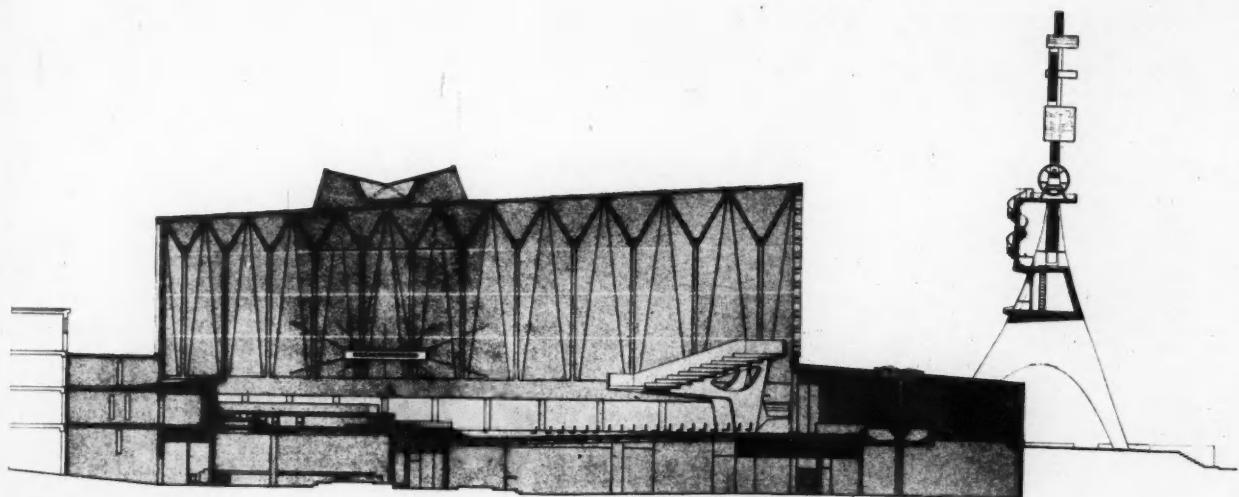


The plan below shows how the church was designed about a sacramental axis; with baptistry-atrium, confessionals, altar, and throne aligned. The sacristy serves as a link to join the monastic wing and church; the chapter house, where worldly affairs are conducted, is an appropriately separated unit joined to the complex by way of a cloister walkway.

The bottom photo at left shows the altar and throne end of the church, with its divided choir and suspended baldachino of wood painted white, suspended below the lantern. The floor is of waxed red brick; the altar, communion tables, lectern, and throne of granite and bush-hammered concrete; the choir and congregation stalls are of dark-stained oak. The two top photos at left show the baptistry and the balcony as one looks to the rear of the church







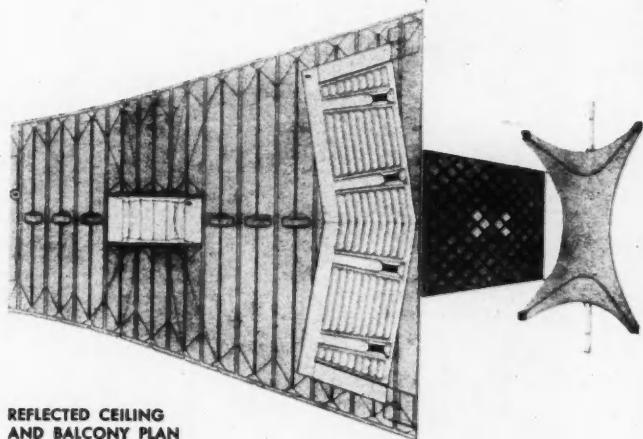
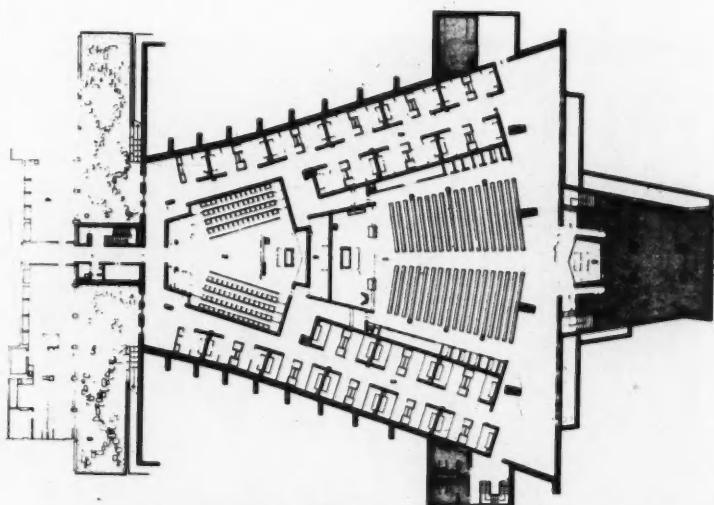
LONGITUDINAL SECTION

At the lower level of the church building there is a parish church seating 450 (top photo); the Brothers' chapel for 104 (center photo); a series of 34 private Mass chapels (bottom left photo); and a relic shrine (bottom right photo), which is located at the rear of the parish chapel.

Regarding structure as it affected the design, architect Breuer says, "Plans and details of St. John's were based upon a meticulously re-examined liturgical tradition. To crystallize this tradition was a vital contribution of the devoted monastic community to the building.

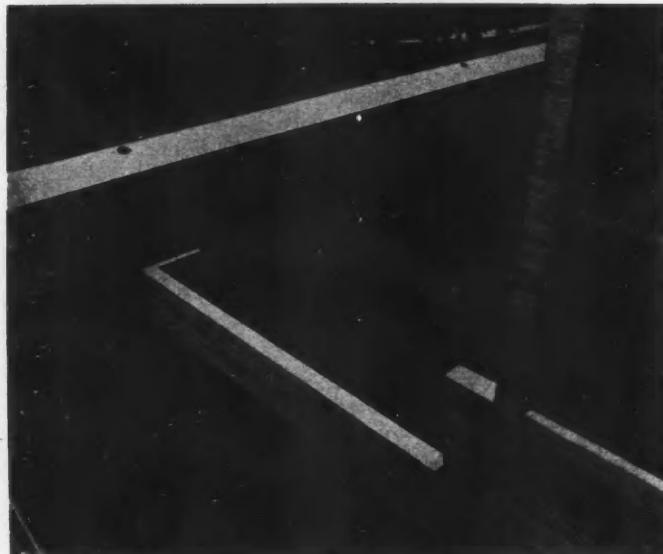
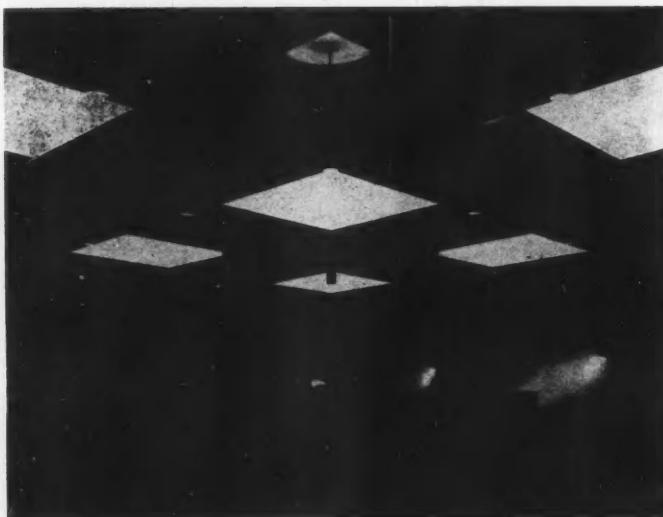
"Although the church may be a new sensation to the eye, its architectural concept resembles in some ways those of religious buildings in the Middle Ages and the classic period. Whether stone lintels on stone columns are employed, or Roman or Gothic arches—whether dome, barrel vault, or folded concrete plates—church architecture at its best is always identical with the structural logic of the enclosure. This identity is basic, dominant, and visually so obvious that it almost appears simple, though it holds infinite subtleties. The rhythm of space is that of its structure, despite important differences of technology and form: in the old days stone on stone, held in place by the weight of its parts; now, one flowing line of concrete held in place by the continuity of steel bars.

"How much we will be affected by the building—how strongly it will signify its reverent purpose, will depend on the courage it manifests in facing the ancient task of defeating gravity and lifting its material to great heights over great spans, to render the enclosed space a part of infinite space. The structure tells its story by the eternal laws of geometry, gravity, and space. This is true for the bell banner also. It is a slender cantilevered slab on parabolic supports. This form, or symbol, is made possible by our technology; by new building methods, new materials, and modern engineering. But still, it is ruled by the same eternal laws of gravity, geometry, and space."

REFLECTED CEILING  
AND BALCONY PLAN

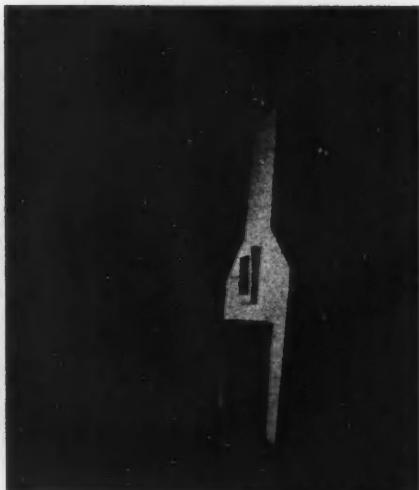
CRYPT OR LOWER LEVEL PLAN

*Saint John's Abbey*



The top photo at left shows the interior of the chapter house, looking toward the dais and chairs for abbot, prior, and chapter secretary. The chapter house is reached by a cloister walkway, pictured in the next photo below, and is lighted by nine vertical windows extending above the roof in monitor form clerestories. The room's unbroken walls of granite ashlar block are symbolic of the secrecy in which matters discussed here are held.

The two lower photos picture a monastery passage (at left) and the reception room for the abbot's office (at right). The fireplace of bush-hammered concrete is one of four special designs made by Breuer for the monastery. Woodwork in both monastic wing and church is of oak stained to a black-brown tone. The random split granite block—native to the region—is in a range of grays running from light to dark.





*All photographs by Joseph W. Molitor*

## Church Designed for Difficult Site and Low Budget

Fine proportion, handsome details, distinguish small suburban Congregational church by Pietro Belluschi and Carl Koch & Associates

NAME: *Park Avenue Congregational Church*

LOCATION: *Arlington, Mass.*

ARCHITECTS: *Pietro Belluschi and Carl Koch & Associates, Associated Architects; Frederic L. Day, Jr., associate in charge*

STRUCTURAL ENGINEERS: *Souza & True*

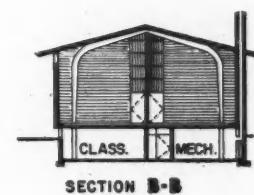
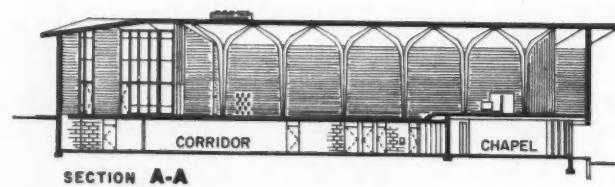
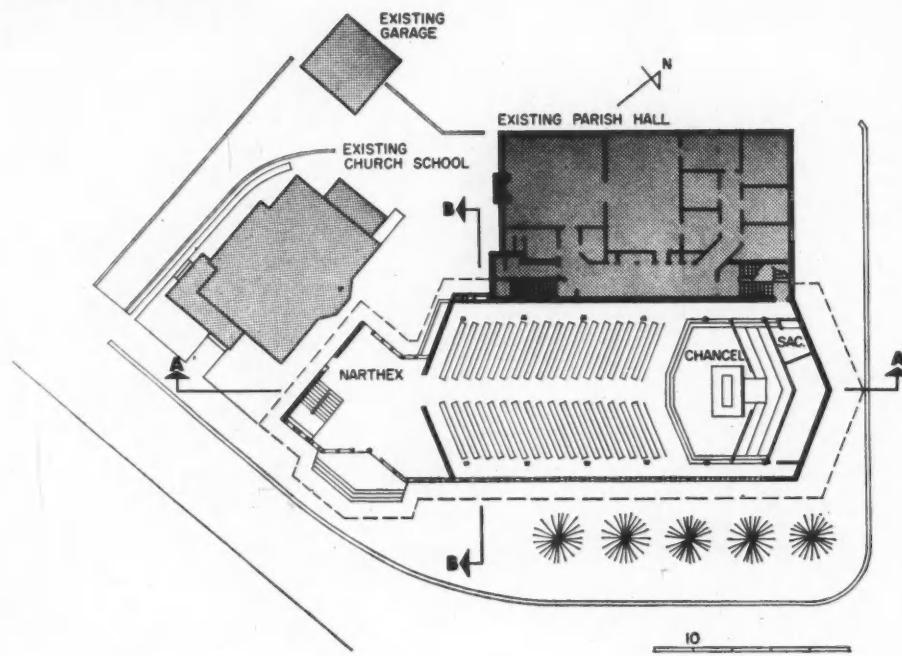
MECHANICAL AND ELECTRICAL ENGINEERS: *Fred S. Dubin Associates*

ACOUSTICAL ENGINEERS: *Bolt, Beranek and Newman*

HORTICULTURALIST: *Alexander Heimlich*

GENERAL CONTRACTOR: *Hans Tobiason*

*Church by Belluschi and Koch*

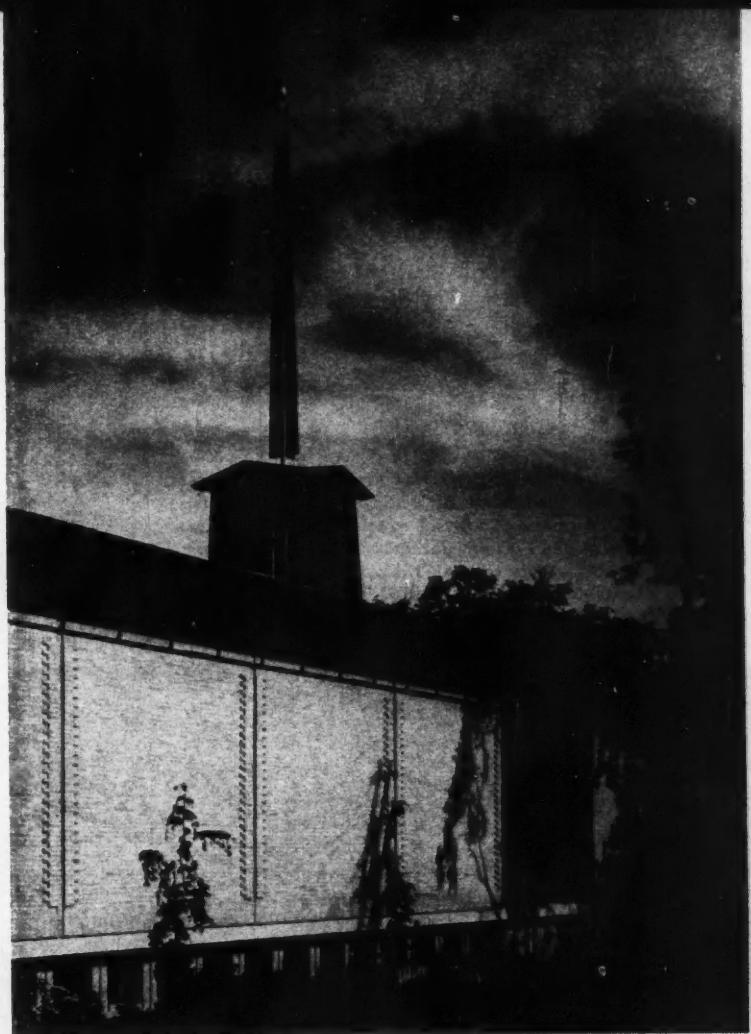


Main entrance. Doors are copper clad

Built on a barely adequate site, sharing a wall with a brick pseudo Georgian parish hall, and hugging a wood frame shingle covered church school, this new church nonetheless presents a remarkably coherent appearance. A study of the plan reveals that the church has been designed so that it may eventually stand alone as a complete entity. Hemmed in as it now is, however, it presents a strong image as seen from the two intersecting streets, by means of a generous welcoming entrance and a beautifully scaled belfry and spire.

The minister, Wilbur D. Canaday Jr. points out that the new church with its "herring-boned" seating plan angled toward the central communion table "permits all in the fellowship to see and hear and participate vitally in the worship . . . a cherished Congregational principle. At the same time this seating arrangement helps preserve the intimacy which was experienced by the worshippers in their former church." The angled pews become the basis of the design organization in plan creating a shape which complements the site and establishes more open space between the school and the parish hall.

Typical of Belluschi's search for means of architectural enrichment which do not proclaim themselves are the exterior vertical brick patterns which articulate the structural system. Note quoins and grooves in photographs at right and on page 148. Such thoughtful yet simple details as this lend elegance to an essentially low cost church built for approximately \$193,000.



A vertically slatted screen, not yet installed will project forward to conceal the point at which the new church adjoins the parish hall

*Church by Belluschi and Koch*

Laminated arches of douglas fir stained a deep red brown contrast with fir ceiling of natural finish. Louvered screen at rear of sanctuary conceals pipes of second hand organ, purchased at a great saving. Organ console is concealed directly behind panel at altar table. Choir sits behind lower screen which aligns with panel. When seated their heads may be seen through the more widely spaced louvers





Narthex. Stair leads to chapel and classrooms below.  
Entrance to nave is at right



Chancel



Nave

*Church by Belluschi and Koch: details*

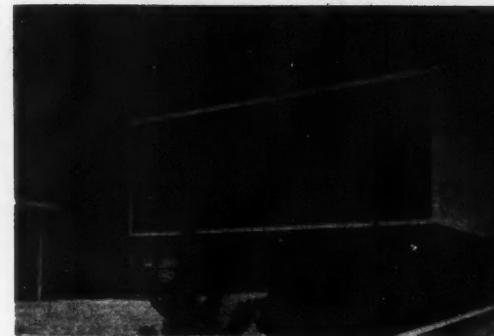


*Above:* pews were designed to minimize bulk, give a feeling of lightness. Chancel floor is English heather brown quarry tile, nave floor is asphalt tile in a pattern similar to cork. *Below:* reinforced concrete foundation has pattern of deep vertical grooves, rose colored brick is laid in an effective design



# FIVE HOUSES FOR ENJOYABLE SITES

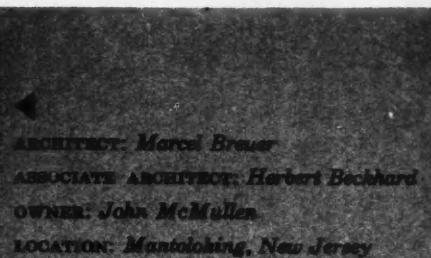
A group of houses  
emphasizing  
spaciousness and  
suitability to site,  
well executed in  
simple materials



ARCHITECT: *Campbell and Wong & Associates*  
OWNER: *John Corden Campbell*  
LOCATION: *Mokelumne Hill, California*



ARCHITECT AND OWNER: *Fletcher Ashley*  
LOCATION: *Ogunquit, Maine*



ARCHITECT: *Marcel Breuer*  
ASSOCIATE ARCHITECT: *Herbert Beckhard*  
OWNER: *John McMullen*  
LOCATION: *Matahiking, New Jersey*



ARCHITECTS: *George Fred Keck, William Keck*  
OWNER: *Dr. Robert E. Bloom*  
LOCATION: *North Muskegon, Michigan*



ARCHITECT: *Francis Joseph McCarthy*  
OWNER: *Mr. and Mrs. W. Coy Filmer*  
LOCATION: *Douglasville, California*



## BREUER BUILDS FOR THE NEW JERSEY SHORE

The sculptural quality of architecture—a three-dimensional aspect too often ignored in simpler structures—has been given a dominant role in this handsome house for the seashore of New Jersey. Breuer's well known concern for sun and shadow, plus an adept interplay of interesting textures, has added an enormous interest to this otherwise simple "box" structure.

The plan employs a "raised basement" scheme, with the two upper, principal living floors well expressed on the exterior. The inset ground floor is devoted to garage, entry, shower room, heater room, and a maid's or guest room. The next, or main, floor consists of living room, dining room, kitchen, utility room and study. The arrangement provides both privacy and spaciousness for entertaining. The living area itself is a full two stories in height, and dominated by a striking sculptured fireplace. The upstairs bedrooms for parents, child and guest, open off a balcony fitted with a series of sliding screens for privacy when desired.

The structure rests on concrete block foundations; the frame is wood with exterior walls of painted concrete block and painted board and batten. The roof is tongue and groove planking with a built-up topping. Floors are fir plywood, bluestone and concrete; plywood areas are surfaced with vinyl tile or sisal matting. Interior partitions are wood studs surfaced with gypsum board. Ceilings are cedar boarding.

**ARCHITECT:**

*Marcel Breuer*

**ASSOCIATE ARCHITECT:**

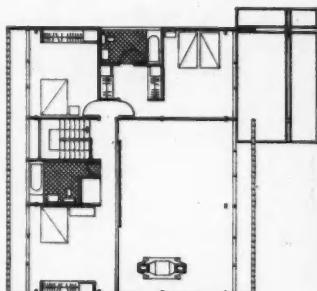
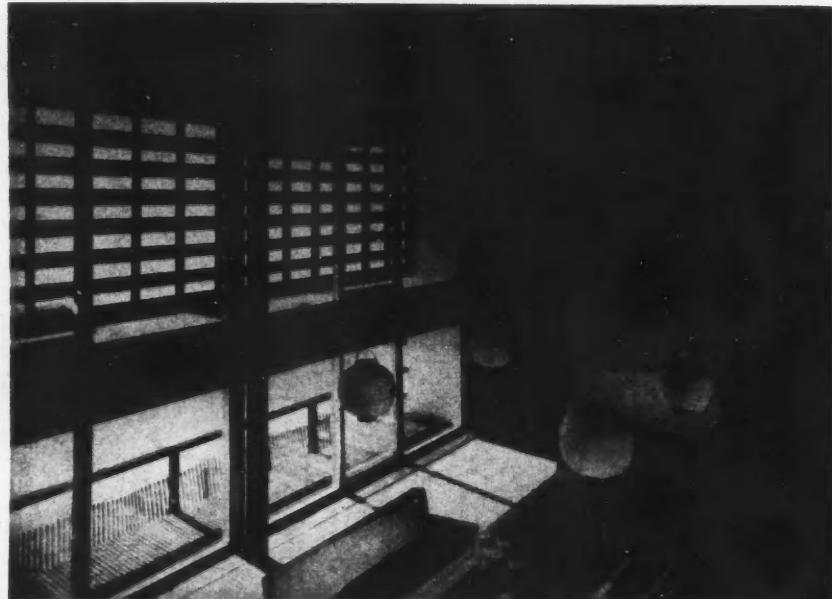
*Herbert Beckhard*

**OWNER:**

*John McMullen*

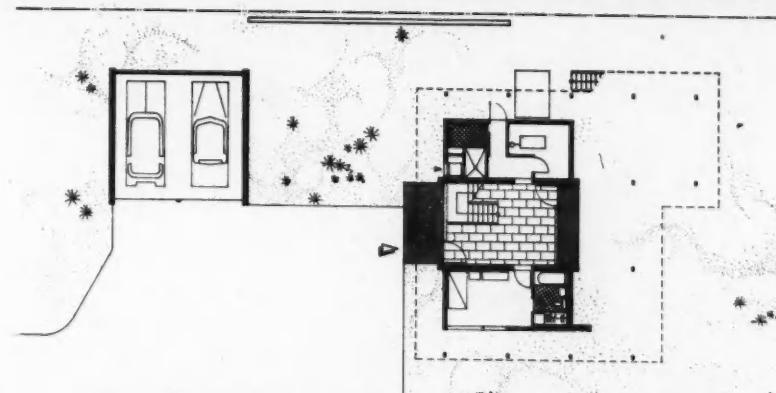
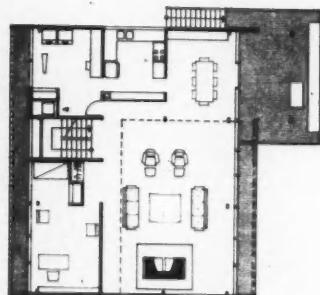
**LOCATION:**

*Mantoloking, New Jersey*

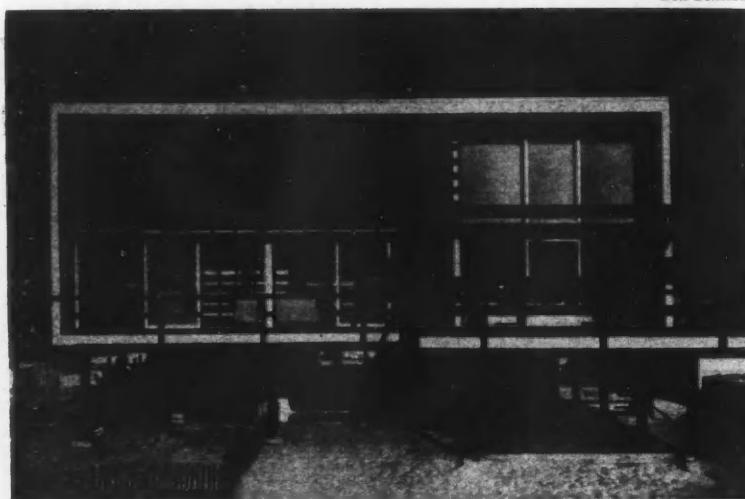


3

Ben Schnall



*Ben Schnell*



### The McMullen House

Sun control is provided on the two major glass walls of the house by a series of wood louvers, which also help reduce sand and sky glare; in addition there are roll-up blinds on the interior.

Indoor-outdoor connection is achieved by stairs from the main floor balcony and terrace. The area beneath the terrace plus the inset areas surrounding the lower floor give shady spaces for lounging.

The abstract, sculptural quality of the house is emphasized by the trellis over the terrace, and by the carefully studied fenestration.

## A FLEXIBLE OPEN PLAN FOR A COUNTRY COTTAGE

ARCHITECTS: *Campbell & Wong & Associates*

OWNER: *John Carden Campbell*

LOCATION: *Mokelumne Hill, California*

SPONSOR: *Western Pine Association*

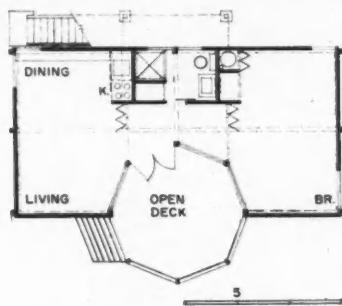


*Morley Baer*



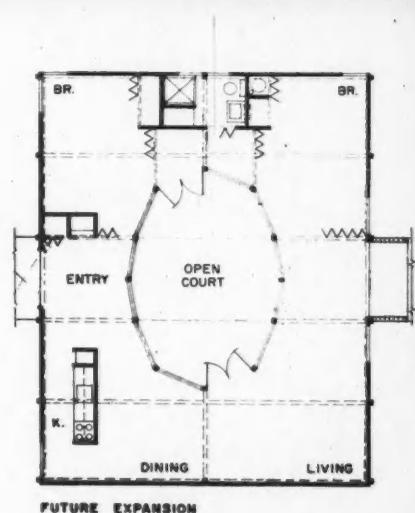


*Morley Boer*



PLAN ABOVE: possible first stage for building the house in two phases  
PLAN RIGHT: completed house as shown

SECTION (far right): simple tongue and groove surfaces used for walls, floors and ceilings



FUTURE EXPANSION



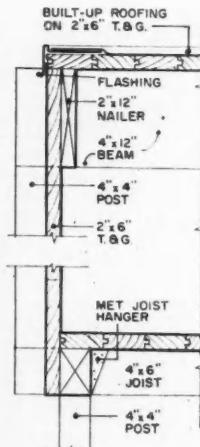
## The John Carden Campbell House

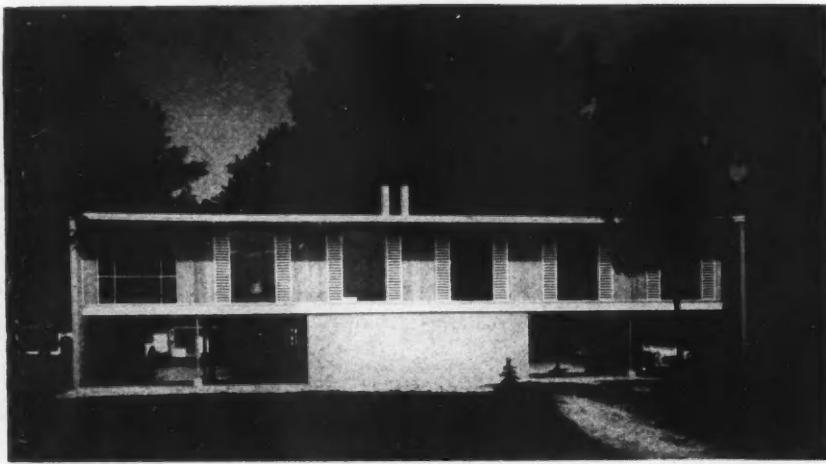
An amazing sense of spaciousness has been developed in this little house of 1,200 sq ft. Built around an open, central court (and planned to be constructed in two stages, if desired—see plans), the house uses folding partitions to create the appropriate living and sleeping spaces. With partitions closed, each room has an exterior window, and one window into the court; this vista is cut off by a window shade. When the partitions are pushed back, the entire house becomes a single space.

The house as built is used primarily as a weekend house, but would very well adapt itself to full time occupancy. The architects state that the house cost under \$7,800 (with heating, plumbing and electricity kept to a minimum), but might be constructed for regular use in an incorporated community for around \$10,000.

The house is of extremely simple construction (note section), with all walls, ceiling and floor made of 2-in.-thick tongue and groove kiln-dried white fir decking. The same wall forms both exterior and interior surfaces. It is located in the Mokelumne Hill area in the foothills of the Sierra Nevada Mountains in eastern California.

The interiors are finished with white-painted walls, dark-stained floors and ceilings stained yellow ochre.





## A RAISED COTTAGE FOR A LAKESIDE SITE

The traditional Southern raised cottage scheme has a logical counterpart in this Michigan lakeside house. Fundamentally, it is a one floor house, but has been raised a story above the ground level to gain better views (see photo right) and to afford sheltered sitting and parking space below (note lower level plan).

The design incorporates a typical, and well handled, Keck device of flanking fixed glass view areas by wood louvers, which are in turn backed by doors to control ventilation and drafts. These form a major design feature, with the rest of the house subordinated with a simple, restrained elegance.

In such a scheme, the entrance stairs become a more dominant factor; as can be seen in the photo below, the stairs and entrance hall have been carried out in a handsome and welcoming fashion.

The house has foundations of concrete block and poured concrete. The frame of the house is of wood, masonry and steel, and is surfaced with wood and concrete block. Interior walls are painted concrete block, wood, and hardboard. Floors are concrete, surfaced with asphalt tile. All vent louvers are fitted with plastic screens for insect protection.

The heating system is a hot water, radiant one, located in the floors. Baths have auxiliary electric space heaters. The kitchen includes a garbage disposer and dishwasher.

### ARCHITECTS:

*George Fred Keck-William Keck*

### OWNER:

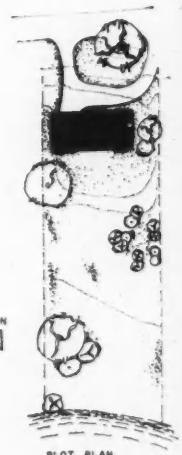
*Dr. Robert E. Bloom*

### LOCATION:

*North Muskegon, Michigan*

### CONTRACTOR:

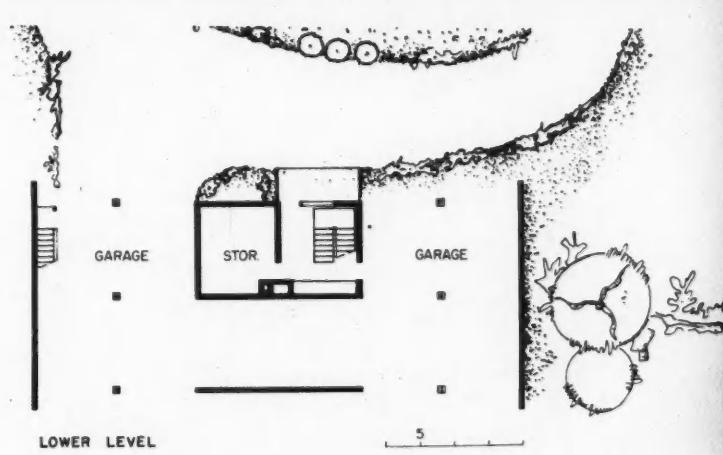
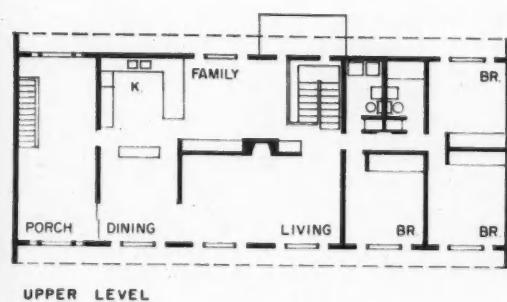
*F. Jack Rose*



PLOT PLAN



*Hedrich-Blessing*



Hedrick-Blessing



### The Bloom House

The front approach to the house (top photo) permits clear views, under the house, of the lake beyond. The end and lower level walls are painted concrete block; walls of the upper, main level are stained wood.

The living room (center photo) carries out the same materials as the exterior for wall surfaces, and achieves a look of luxury with economy.

The kitchen (bottom photo) carries out the wood and masonry theme. Big windows are on the dining end of the room; the kitchen area proper is lighted by a skylight.

ARCHITECT AND OWNER: *Fletcher Ashley*  
LOCATION: *Ogunquit, Maine*



## A COMMODIOUS HOUSE FOR THE COAST OF MAINE

© Ezra Stoller

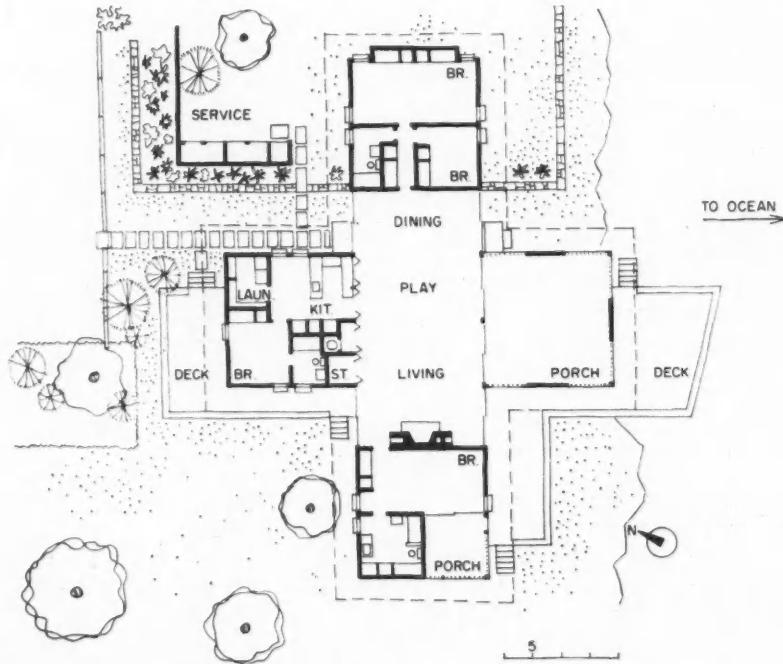


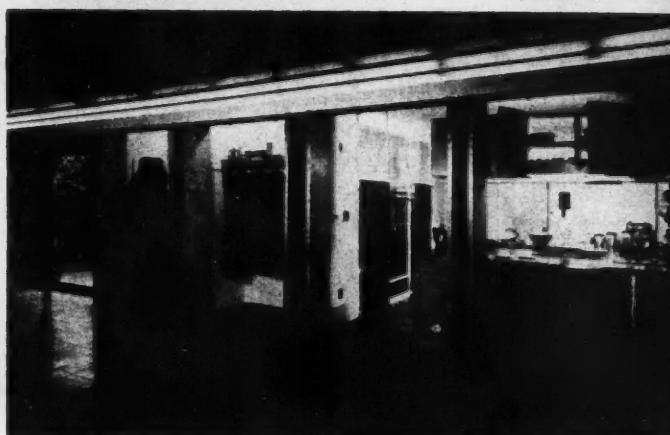
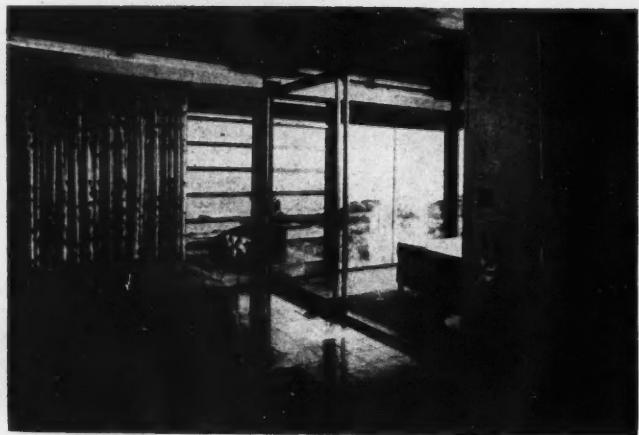


This informal and convenient house sensibly makes the most of its very spectacular Maine coast site. As can be noted in the plan and in the photo above, the house provides a great degree of openness and flexibility in the living areas; these areas are generously supplemented with screened and open outdoor terraces and gardens. The service areas, master bedroom suite, and children's or guest bedrooms flank the living areas on three sides, and are well separated for privacy. The big multipurpose living space provides for all such activities as cocktail parties, dances, ping pong and cards, as well as the usual living and dining functions. The parents' suite has its own dressing and bath facilities, a sitting area around a small fireplace, and a choice of either inside or screened porch sleeping areas. The children (four girls) have their own wing, with double decker bunks which allow extra sleeping spaces for their friends. A guest or maid's room and bath is off the kitchen. Kitchen and storage may be completely opened to the central room by a series of folding doors (note photo, lower right).

Heating is by a forced hot air system, with the furnace in the crawl space. This is supplemented by electric heaters in the baths, and the fireplaces. The frame is douglas fir post and beam on concrete foundations, with board and batten exteriors. Interiors are wood and hardboard; floors are vinyl.

## The Fletcher Ashley House







## A BRIDGE HOUSE OVER A MOUNTAIN WATERFALL

The site of this mountain home is on an old mining claim, which runs along a creek in California's Sierra Nevada. The property is extremely steep, with the only level spot being a small area by the creek bed. To create a big enough building site in this terrain, the architect designed the house to span the creek.

The plan places the master bedroom suite on one side of the creek, with living, dining, and guest rooms on the other side. The bridge portion consists of an enclosed porch with sliding glass doors opening onto an outdoor balcony.

A low dam located downstream from the house creates a quiet pool of deep water, which lowers the noise level of the waterfall and has become a spawning ground for trout.

Materials were chosen for minimum upkeep. Foundations are concrete, and the frame is Douglas Fir; steel beams span the creek. The exterior is clear board and batten redwood. Interiors are redwood, plywood and hardboard. The roof is surfaced with aluminum. Floors are vinyl tile. Aluminum sliding windows are used throughout the house, and fitted with aluminum screens.

The house is heated by electric baseboard units. Thermal insulation is mineral wool. The kitchen is fitted with a garbage disposer, dishwasher.

**ARCHITECT:**

*Francis Joseph McCarthy*

**OWNERS:**

*Mr. and Mrs. W. Coy Filmer*

**LOCATION:**

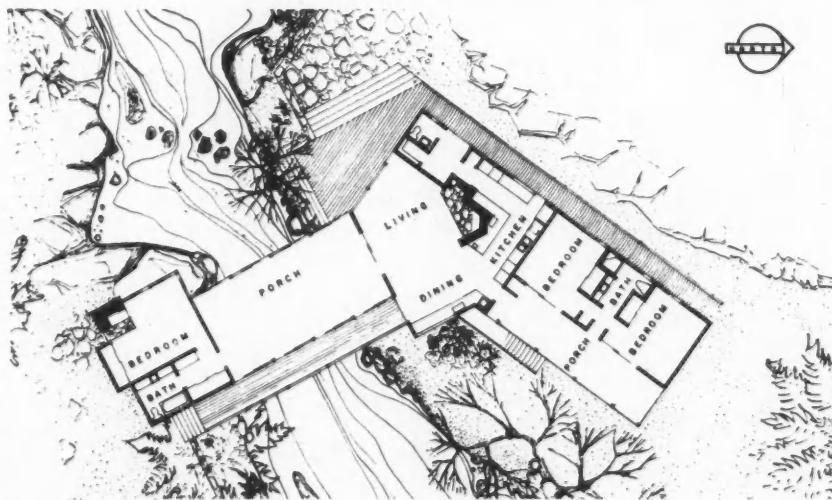
*Downieville, Sierra County, California*

**STRUCTURAL ENGINEER:**

*A. V. Saph Jr.*

**CONTRACTOR:**

*Clarence Dawe*

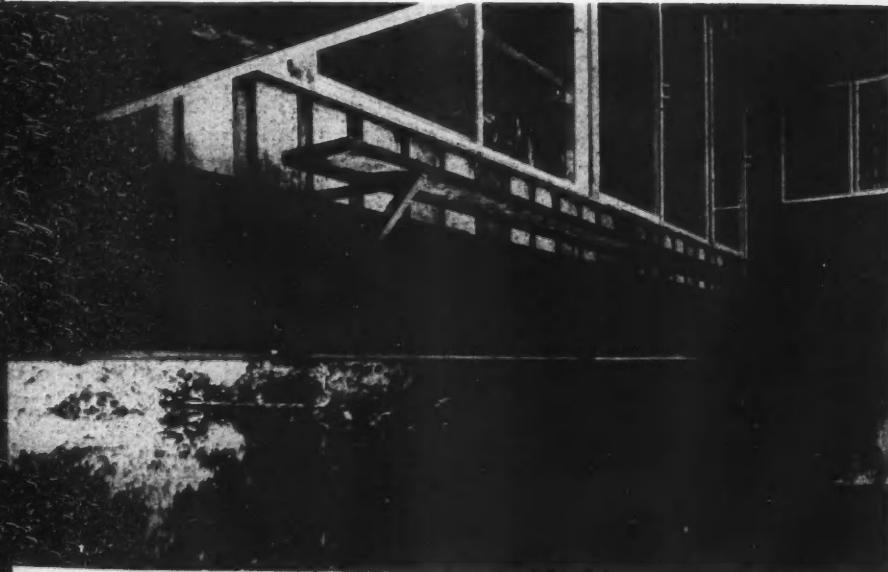


*Skelton*





Skelton



### The Filmer House

Two steel beams, 49 ft long form a bridge across which the central portion of the house rests. The beams are 24-in. wide flange sections, secured with 1½-in. anchor bolts to concrete abutments poured on bedrock at the creek banks. Two lengths of steel were spliced together at the site to form each of the beams. Three-by-ten wooden nailers bolted to the top flanges of the beams provided a means of nailing floor joists to the steel. Steel beams are painted a dull blue-black. A walkway supported by a steel frame (photo bottom) provides footroom for washing windows





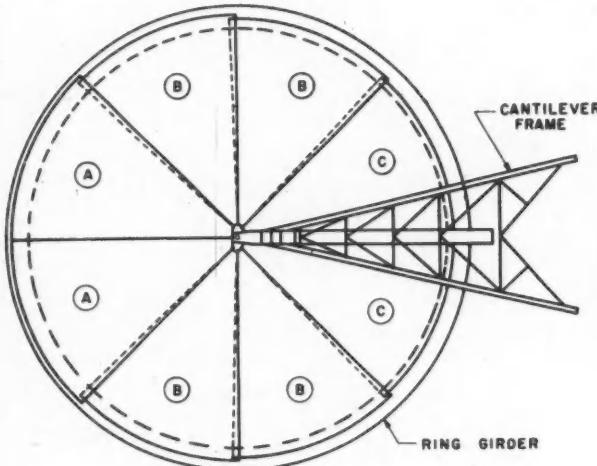
## PITTSBURGH'S RETRACTABLE DOME NOW IN OPERATION

*Over 15 years ago architects Mitchell and Ritchey proposed that Pittsburgh build a civic auditorium with a retractable roof. Their idea which seemed far-fetched to many has at last been realized and Pittsburghers began to enjoy their indoor-outdoor arena this fall.*

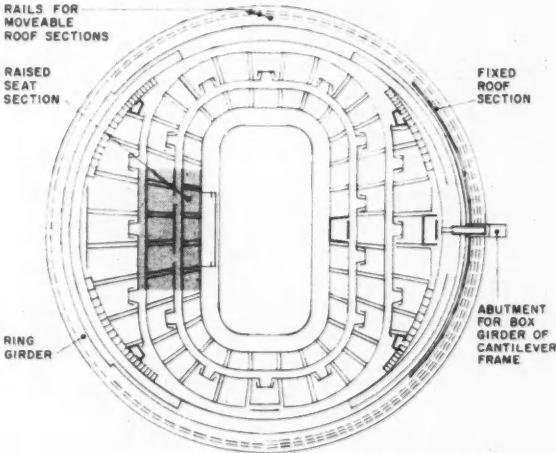
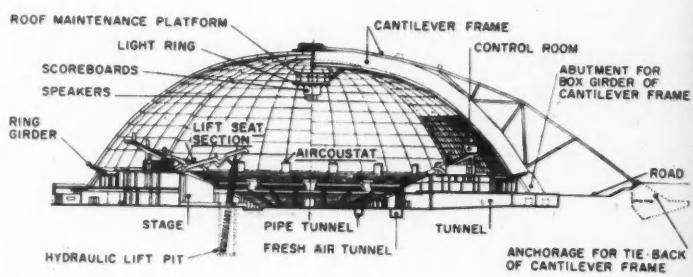
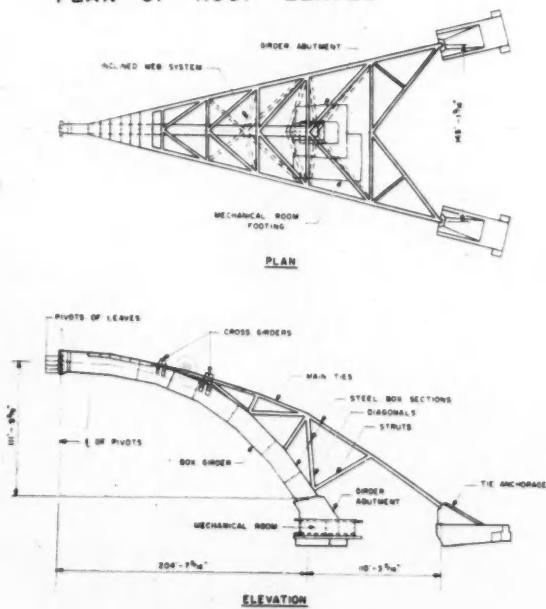
## Pittsburgh's Retractable Dome Now in Operation

NAME: *The Auditorium*  
 OWNER: *Public Auditorium Authority of Pittsburgh and Allegheny County*  
 ARCHITECTS: *Mitchell & Ritchey*  
 CONSULTING ENGINEERS: *Ammann & Whitney*  
 STRUCTURAL ENGINEER: *Robert A. Zern*  
 ELECTRICAL ENGINEER: *Carl J. Long*  
 MECHANICAL ENGINEERS: *Dzubay & Bedsole, John W. Mullin*  
 LANDSCAPE ARCHITECTS: *Simonds & Simonds*  
 GENERAL CONTRACTOR: *Dick Corporation*

A - TOP LEADING MOVABLE LEAF  
 B - INTERMEDIATE MOVABLE LEAF  
 C - BOTTOM FIXED LEAF



PLAN OF ROOF LEAVES



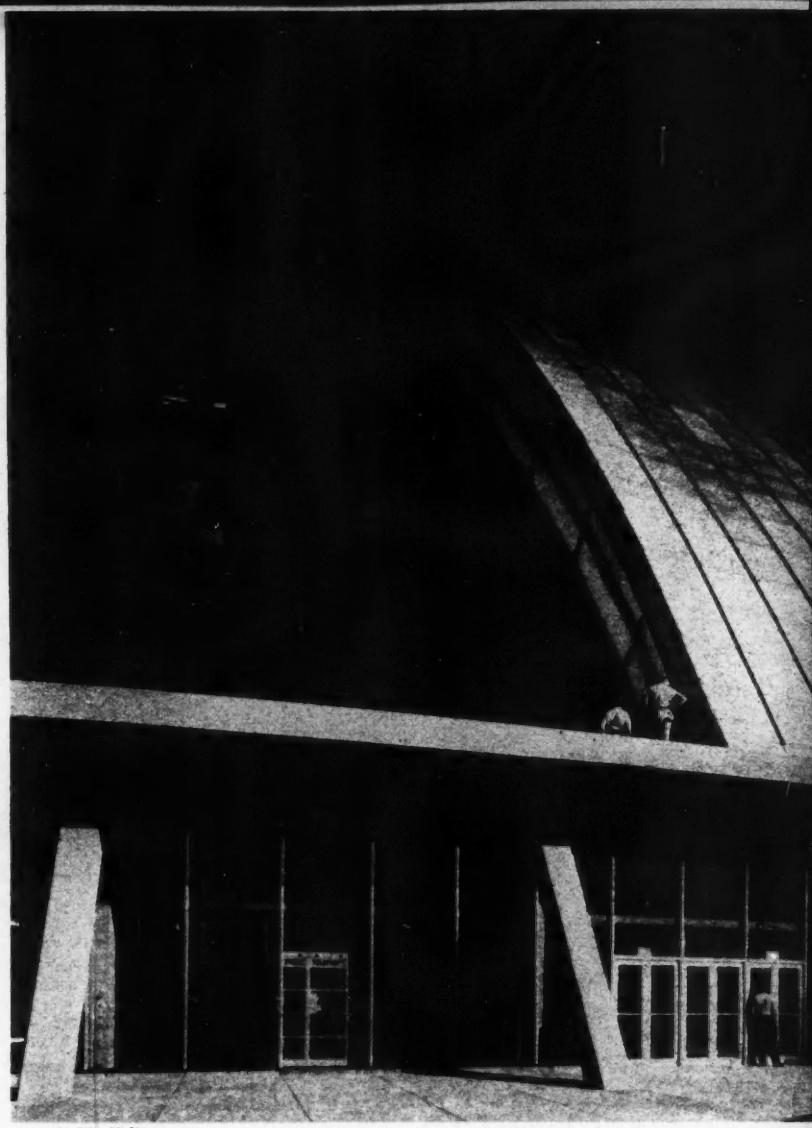
The auditorium, nearly circular in plan is approximately 417 ft in diameter. The lift seat section (2,200 seats) raises to form a canopy over a well equipped stage. There are 9,200 permanent seats with 4,400 available on arena floor for special events. For example 10,500 seats are available for hockey and 13,600 for boxing. The interior of the box-girder shown in the section above as part of the cantilever frame contains a stairway for access from the auditorium to the winch platform suspended directly beneath the leaf pivot points. It is also a path for lighting cables.

Constructed for approximately \$20,000,000 on a 20 acre site as part of the redevelopment of 95 acres at the upper end of the Golden Triangle in the formerly blighted Lower Hill district, Pittsburgh's auditorium, convention hall, open air amphitheater and exhibition center is an architectural and engineering phenomenon. It boasts one of the largest clear span roofs in the world, which at the press of a button folds back upon itself, opening or closing in 2½ minutes. No such roof has ever been built before.

The brief technical description which follows has been condensed from information furnished to the RECORD by Edward Cohen, an engineer for Ammann & Whitney who played a major role in the structural design of the auditorium.

The roof is divided radially into eight approximately equal sections, six movable and two stationary. When the roof is retracted, the six movable sections (three on each side) will glide one over the other to rest on top of the two fixed sections. Each roof leaf is a 45 degree sector of a circle with a radius of approximately 207 ft and weighing 300 tons. The distance from the ring girder rail to the roof pivot measured along the roof curve is approximately 250 ft. The leaf is constructed of 30 in. deep WF beams which radiate toward the center pivot and are connected by 24 in. deep WF cross frames, 8 and 10 in. WF purlins and a complex system of bracing at the top and bottom flanges of the purlins to stiffen the leaves against traction, wind and bumper forces. The 30 in. WF ribs are spaced 27 ft apart at the base and as the leaf decreases in width toward the apex, alternate ribs are discontinued, their loads being transferred by cross framing to adjacent ribs.

At the apex of each leaf is a pivot weldment with a spherical stainless steel knuckle which is pinned into a multiple clevis weldment which delivers the leaf thrust, a maximum of 350 tons, through the pivot to the cantilever frame. This frame which projects 205 ft over the auditorium from the center of the ring girder is basically an inclined, curved tripod. The lower leg of the tripod, an 8 ft by 7½ ft box-girder follows the curve of the roof. The two upper legs of the tripod, also chords of a curve, are each 3 ft by 3½ ft box-members acting as the tension tiebacks. They terminate in concrete anchorages, and are held away from the box girder by triangular frames consisting of struts and cross ties. When the leaf's nest, the tip of the cantilever frame moves outward 3 in. and downward 6 in. An unbalanced snow load on the closed roof causes a sideward movement of about a foot.



Joseph W. Molitor

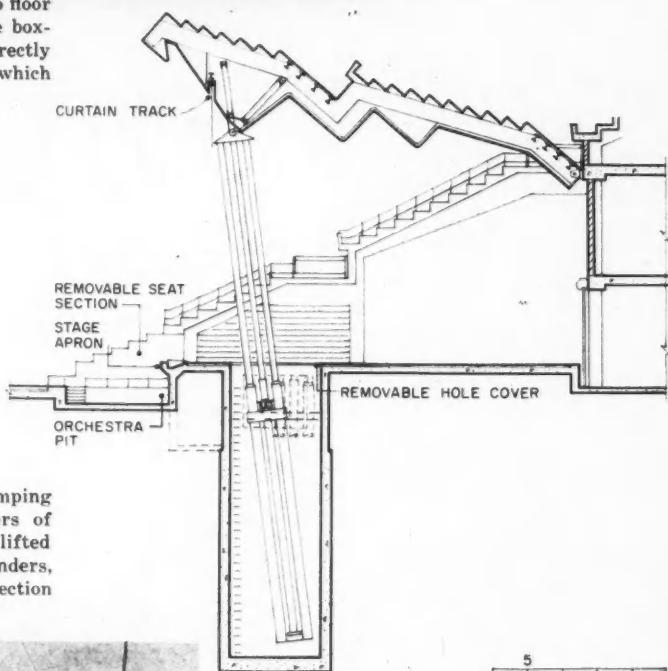
Roof opens or shuts at the press of a button in 2½ minutes. Roof is not yet fully open in photograph above. Six movable segments nest above remaining two fixed segments when roof is completely open. The structural frame of each leaf is covered with metal decking, 2 in. rigid insulation and stainless steel roofing. The interior surface is of acoustic metal made of perforated zinc coated sheet steel with a baked enamel finish enclosing 2 in. of acoustic insulation. Total thickness of each leaf including roof and ceiling is about 3 ft. Photograph below shows tripod shaped cantilever frame which supports pivot about which roof moves





Joseph W. Molitor

Interior with dome fully closed. Lighting fixtures drop to floor for servicing. The main electric cable runs through the box-girder of the cantilever frame to the power center directly below the dome pivot. Here it connects to flexible cables which connect to distribution panels in each leaf



The lift seat section is operated by high pressure pumping units which cause four 42 ft long hydraulic plungers of 12% in. diameter to raise and lower it. The total weight lifted by these jacks is 445,000 pounds. Two additional cylinders, one on each side, serve as locking posts to secure the section in the "up" position



Associated Photographers

# INDUSTRIAL BUILDINGS

Buildings for research and buildings for manufacture designed for future expansion strike two optimistic notes in the portfolio of current activity which follows. Research scouts the horizon of new products and new venture. The expandible plant, conserving the strength of its owner against over-extension, is testimony to his confidence in future growth. Confirmation of this happy rationale is sounded in the final example of one company's three-fold expansion on a site and plan developed only three years ago.

Whatever the doleful compilations of recession, taxation, or inflation; whatever the per cent relationships of this to next or prior years; the annual outlay for manufacturing plant construction is on the order of two billion dollars; for industrial research facilities, 650 million. Add to these the almost equal figures for non-manufacturing industries and subtract the pipes and kettles of the petro-chemicals. The result is a sizable melon at worst—and it is growing.

What's in it for the architect?

First, he has to get the business. How? By making known his present and growing skills in solving the manifold problems of industrial location and construction. By calling on the skills of others in finance, real estate, transportation, community and labor relations, and all the impinging areas of expertise which he alone is best qualified to orient within a single plan. By knowing costs and what they mean to clients.

The examples in this study amply demonstrate these skills and the increasing climate of acceptance of their role in industry. Architects are no longer summoned merely to contrive the façades of corporate images. The rewards of increasing sophistication and broadening services of architects in their industrial solutions are everywhere apparent. The industrial landscape they are steadily re-creating is their finest testimonial.

Wm. B. Foxhall

Clyde Hare photo; Koppers Co. Research Center; see page 176



## CAMPUS PLAN FOR A FIVE-BUILDING RESEARCH CENTER

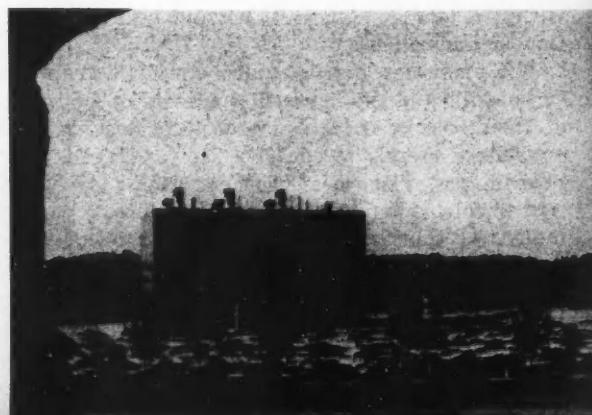
*A large and complex pharmaceutical research program and owner's insistence on an academic atmosphere led architects from site selection through detailed programming to a fitting solution, neighbor to a university*



*Parke, Davis & Company  
Research Laboratories  
Ann Arbor, Michigan*

*Skidmore Owings & Merrill  
Architects and Engineers*

*Barton-Malow Company  
General Contractors*

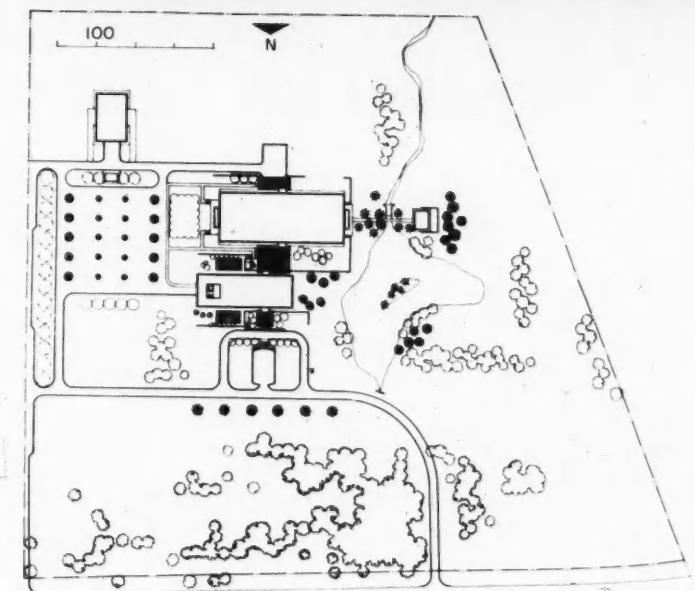
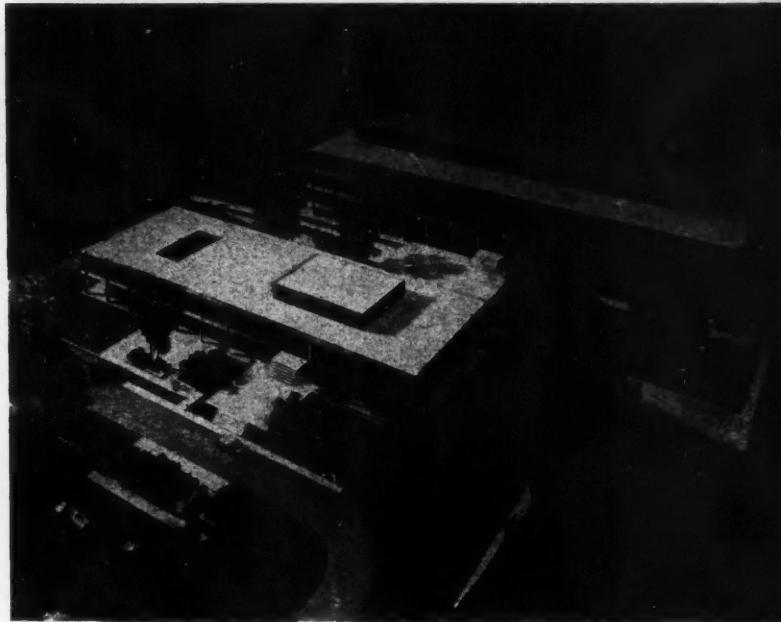


From selection of a site in Ann Arbor, adjacent to the campus of the University of Michigan, to interior decoration and furnishing of administration offices, development of the Parke, Davis Research Laboratory was an architect-owner team operation of unusual penetration and scope. Important considerations were the owner's wish to be near a research university and to establish an academic atmosphere. The result is a campus-oriented complex of three major buildings: a two-story administration building set in front of a three-story laboratory, and a power plant. There are two ancillary structures: a solvent storage shed visible in front of the power plant at left below, and a high pressure lab across a small stream from the end of the main lab. (See plot plan at right.)

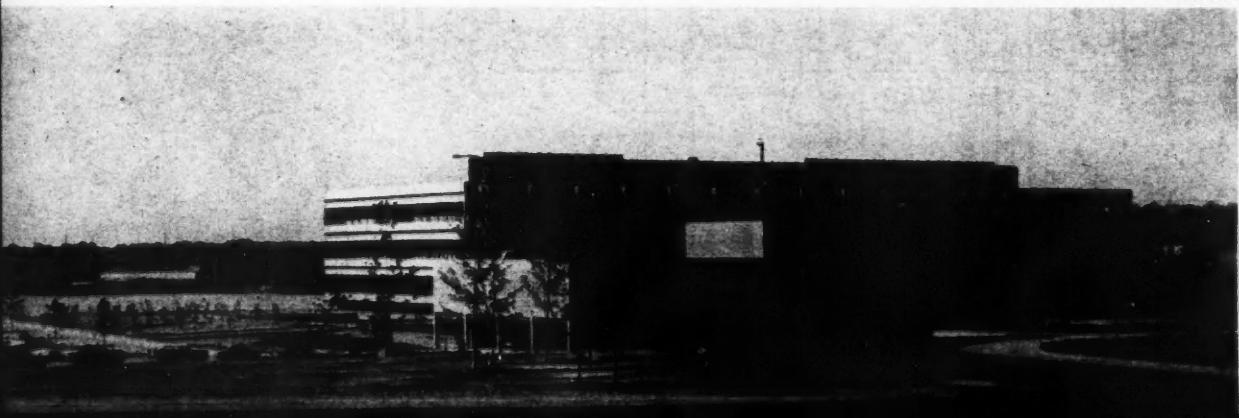
Once the site had been selected, the research program of the company was reviewed in minute detail with respect to space, personnel, traffic, equipment, services, environment control, and relationships among laboratories and other departments. A functional analysis of the whole operation was drawn up to show flow and control points for people, animals, and materials. Plans, models, and full mock-ups were studied, and materials were tested in actual situations.

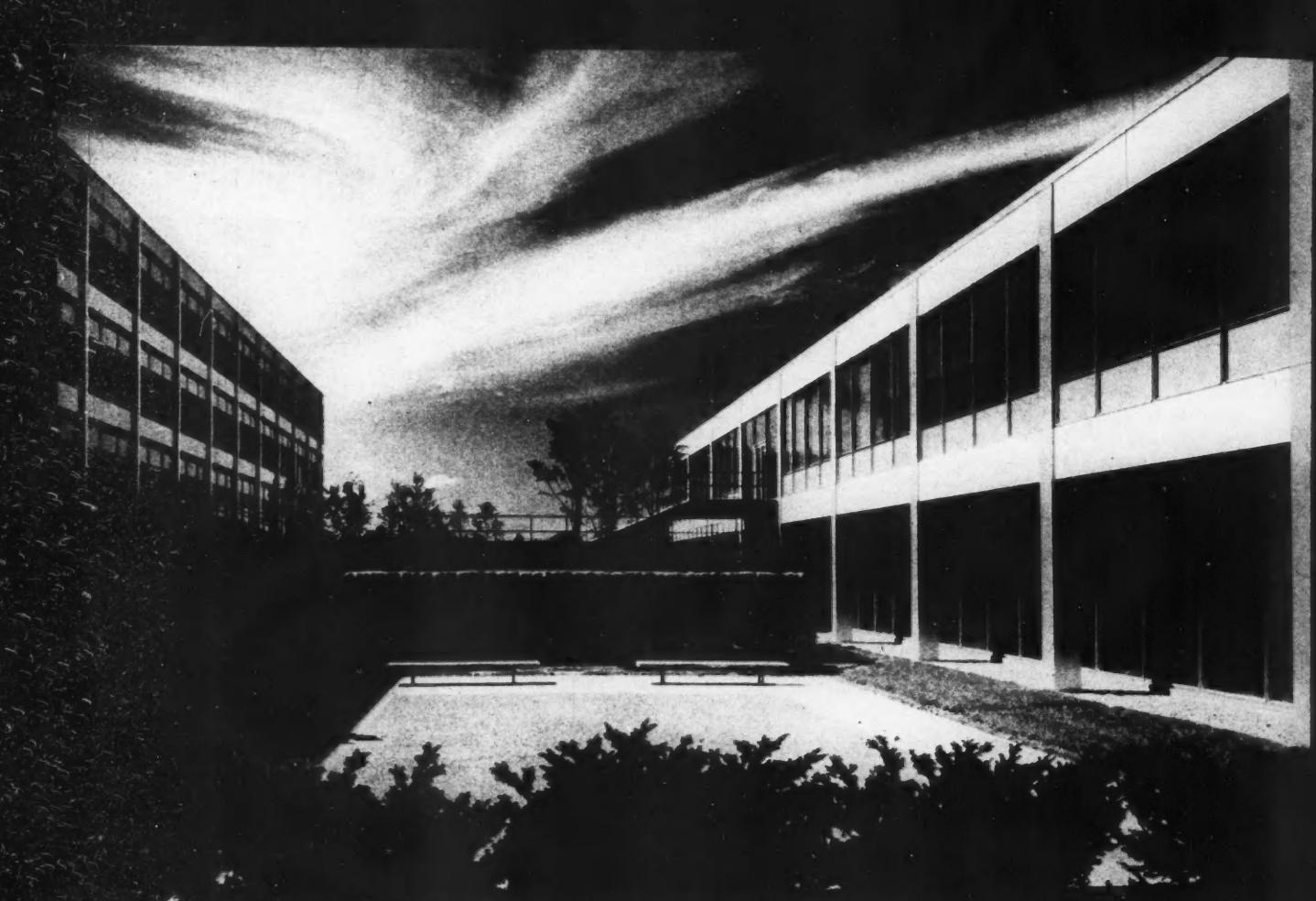
Buildings are framed in structural steel on reinforced concrete spread footings. Exterior walls are precast exposed aggregate panels with aluminum and glass curtain wall. Glass is solar gray plate and double plate. Interior walls are painted plaster and glazed structural units with occasional exposed aggregate panels. Interior partitions are prefabricated aluminum and glass or wood and glass. Floors are reinforced concrete with plastic or ceramic tile.

Hedrick-Blessing



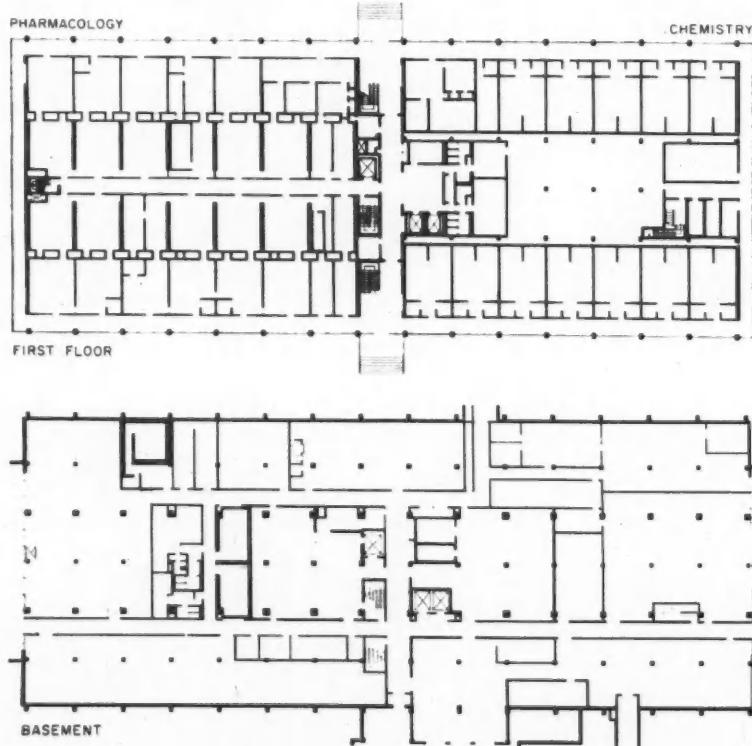
Lens-Art



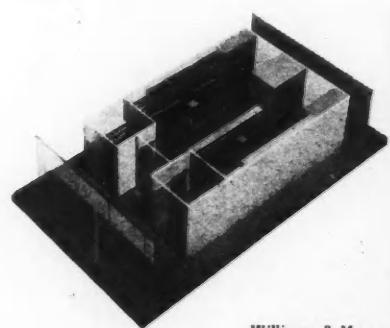


© Baltazar Korab

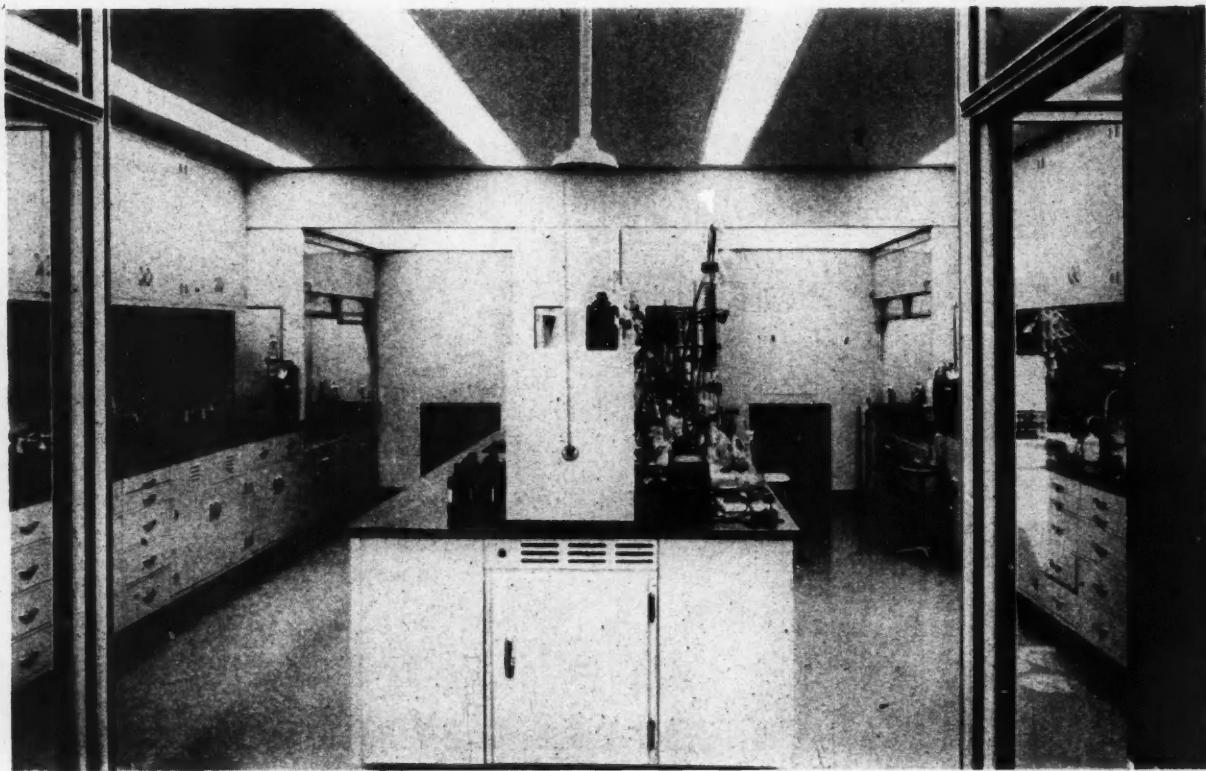
## Parke, Davis & Company



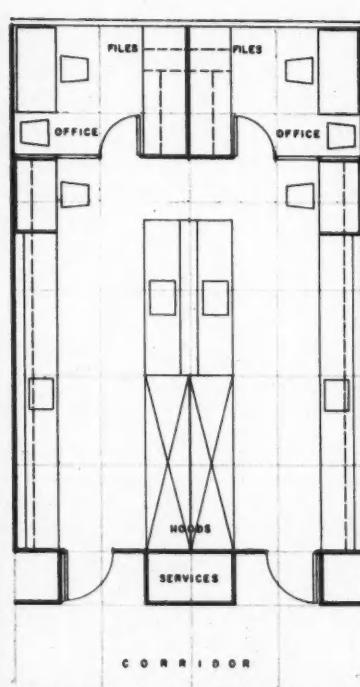
The main laboratory building has three floors above a basement. Upper floors are similar to first floor plan shown at left. The basement contains a receiving dock, mechanical rooms, animal receiving, bottle and cage washing, and supply distribution. Upper floors are about equally divided into two functional areas, chemistry and pharmacology. The chemistry end is built around a central mechanical equipment area with laboratory modules opening to an exterior corridor. The pharmacology end contains interior laboratory or animal rooms along a central interior corridor, back to back with laboratories on the exterior corridor.



Williams & Meyer

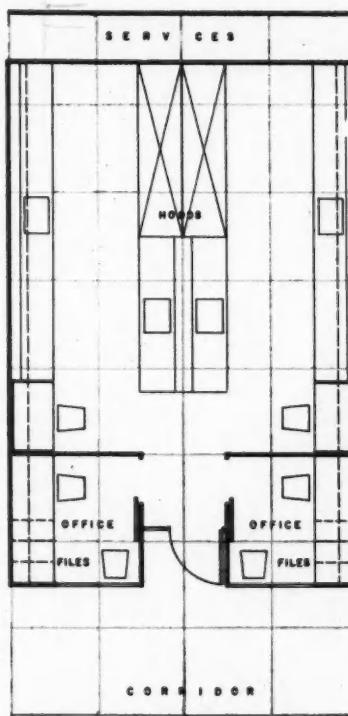


© Baltazar Korab



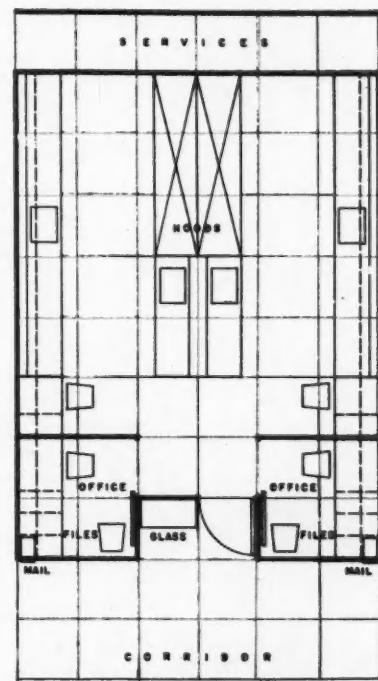
5'-0" MODULE, INTERIOR CORRIDOR

LAB AREA	600 S.F.
BENCH	55 L.F.
SHELF	45 L.F.



5'-0" MODULE, EXTERIOR CORRIDOR

LAB AREA	600 S.F.
BENCH	55 L.F.
SHELF	45 L.F.



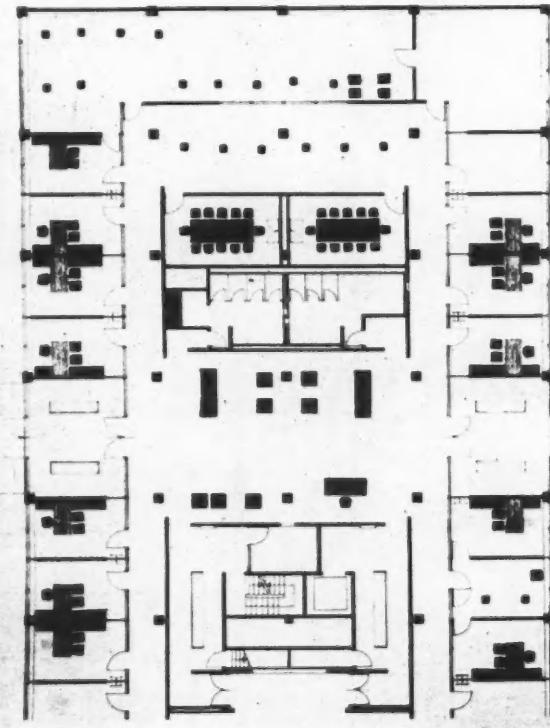
5'-6" MODULE EXTERIOR CORRIDOR

LAB AREA	588 S.F.
BENCH	49 L.F.
SHELF	35 L.F.



*Lens-Art*

Parke, Davis & Company

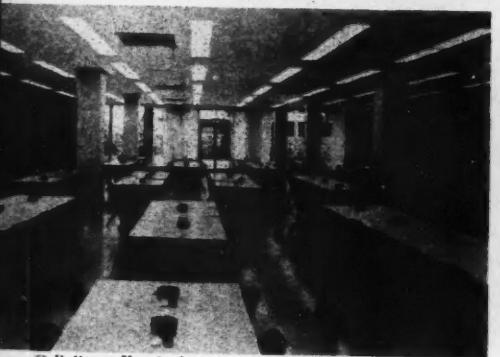
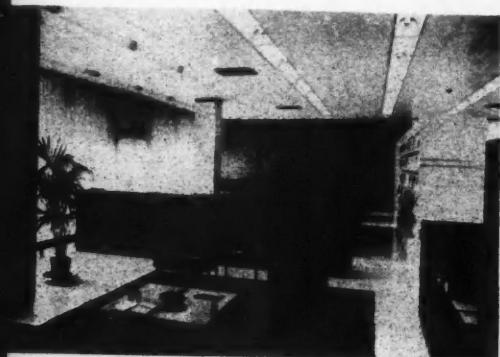


*Williams & Meyers*

Access to the administration building, front and rear, is at both floor levels. Upper floor access in front is by bridging from an embankment; in the rear, similarly, by stair flight to a mid-level terrace between administration and laboratory buildings as shown above. The administration building contains offices, library, auditorium, and cafeteria. Module for offices is similar to that for laboratories but with interior corridors and conference rooms in the executive area. In this structure, the architects executed the complete services including interiors and selection of furnishings, as shown at left and above right.

First floor perimeter offices are air conditioned with reheat low pressure induction units; other areas through conventional ceiling diffusers. Perimeter corridor in the lab building is heated and air conditioned by vertical discharge air grilles at the base of windows. This air is exhausted through fume hood areas as make-up. Medium pressure air is supplied to labs through troffer light-diffuser combinations.

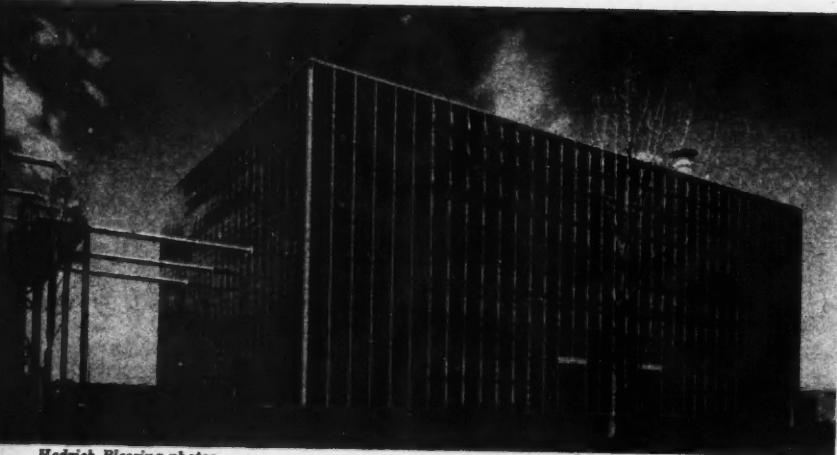
Power plant provides heating and process steam, chilled water, and standby electric current



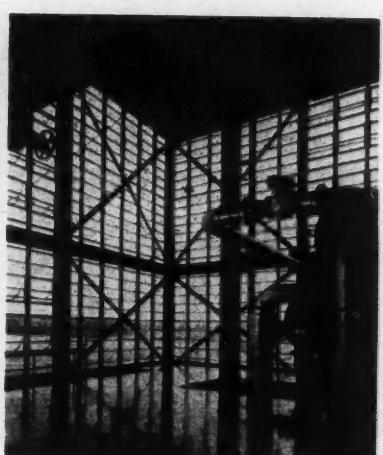
© Baltazar Korab photos



Lens-Art

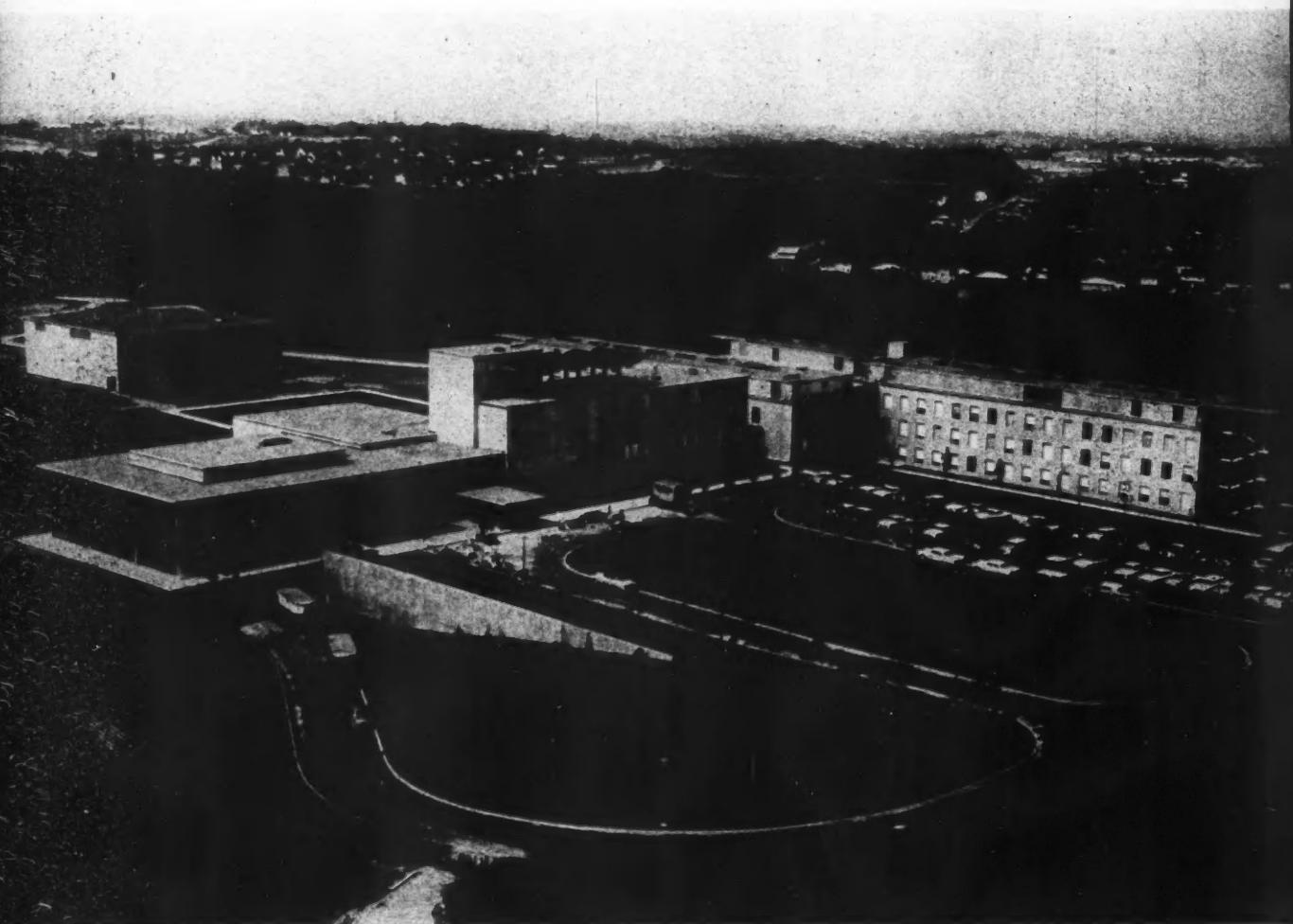


Hedrich-Blessing photos



## EXPANSIBILITY AND FLEXIBILITY ON A MODULAR PLAN

*Atop a wooded hill 18 miles from Pittsburgh is the completed first phase of a research center designed to accommodate the rapid growth and changing needs of seven diverse divisions of an 80-plant highly technical business enterprise*



*Koppers Company, Inc.  
Research Center  
Monroeville, Pennsylvania*

*Voorhees Walker Smith Smith & Haines  
Architects and Engineers  
The Navarro Corporation  
General Contractor*

Koppers' Research Center now consists of a basic structure containing reception, auditorium, library, and dining areas with an attached office wing and three corridor-connected laboratory wings, and a separate boiler house, switch gear house, and gas meter house located on a 176-acre tract "25 minutes by car" from downtown Pittsburgh. Called Somervell Park in honor of Koppers' late president, General Breton B. Somervell, the site provides space for enlargement of present facilities to handle about three times the present chemical and metallurgical research activity. Present facilities are designed for a population of about 600. The anticipated ten-year research program will about double present space.



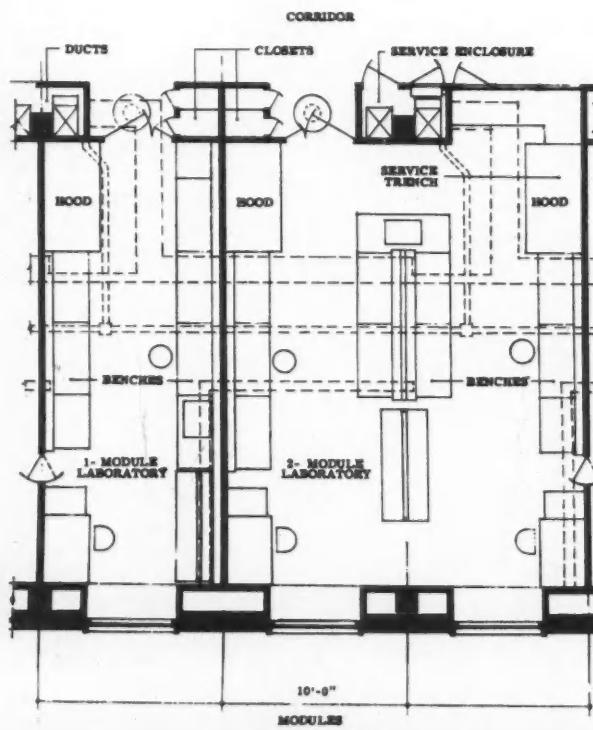
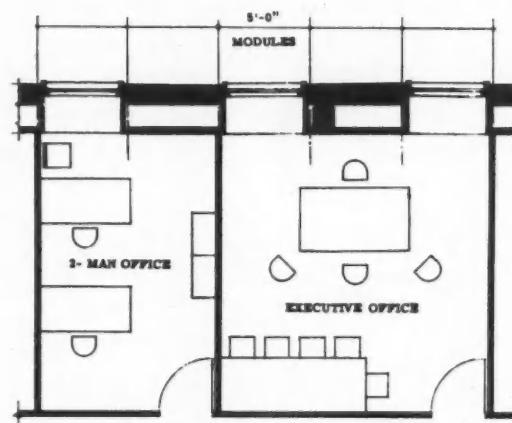
#### LEGEND

- |  |   |
|--|---|
| 1. Laboratory and Office Building        | 10. Cylinder Storage                      |
| 2. Power Plant and Future Research Wings | 11. Nitrogen Tank                         |
| 3. Autoclave Building                    | 12. Gas Meter House                       |
| 4. Coal and Coke Building                | 13. Parking                               |
| 5. Solvent Storage Building              | 14. Future Laboratory and Office Building |
| 6. Switch Gear Building                  | 15. Future Pilot Plant Building           |
| 7. Garage                                | 16. Future Autoclave Building             |
| 8. Gate House                            | 17. Future Model Plants                   |
| 9. Cooling Tower                         | 18. Future Parking                        |

Note: Now completed are nos. 1, 6, 9, 12, and 13 plus power plant at 2



Leonard Schuger

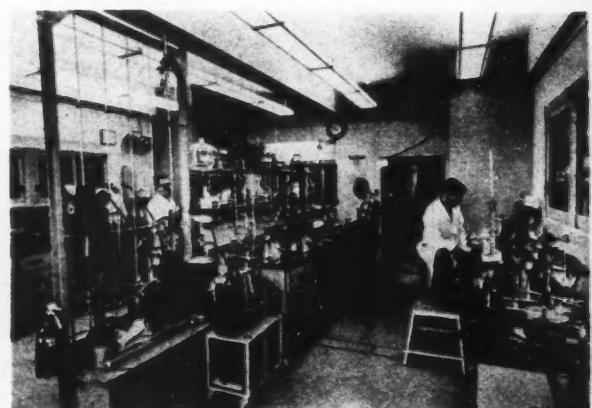


## Koppers Company, Inc.

Both offices and laboratories are designed for flexibility on a modular plan. Each module is completely equipped with services, lighting, power, air conditioning, and, for labs, piped gases, liquids and drainage. The office module is 5 by 15 ft, with a minimum office of two modules. Laboratory module is 10 by 24 ft, and each module line may be centerline of either a partition or an island bench. For safety, each lab has two exits, a safety shower, fire extinguisher, and blanket at the corridor door, and an eyewash fountain near the sink.

### Structure

Framing of the office wing is concrete; other wings and power house, steel. Exterior walls of office wing are limestone veneer; other wings and power house, face brick; cafeteria and library, metal and glass. Interior partitions are foam-cored metal and wood. Floors are concrete with terrazzo or vinyl asbestos tile. Ceilings are painted concrete or suspended acoustic tile.



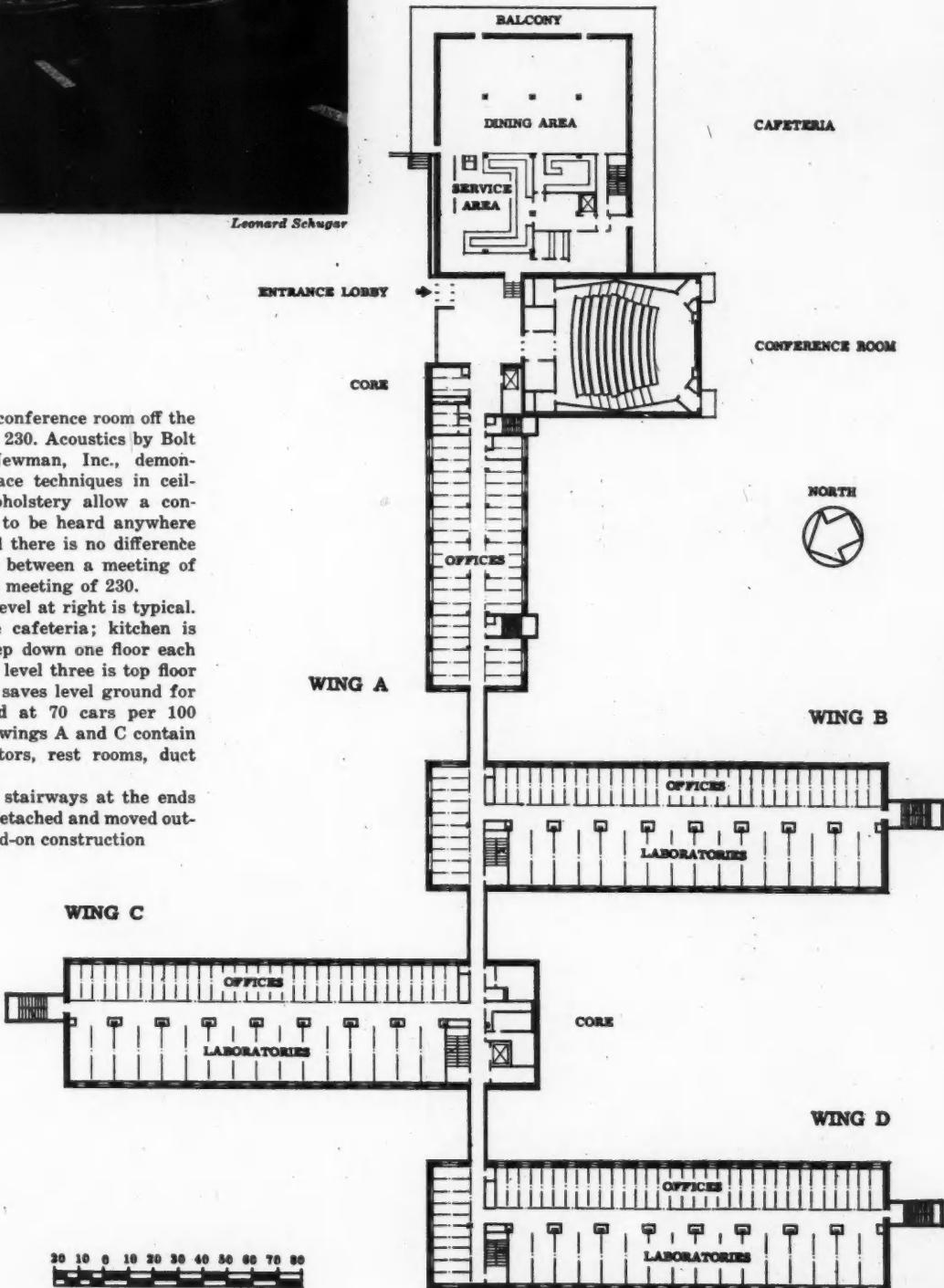


Leonard Schugger

Auditorium and conference room off the main lobby seats 230. Acoustics by Bolt Beranek and Newman, Inc., demonstrate how surface techniques in ceiling and seat upholstery allow a conversational tone to be heard anywhere in the room; and there is no difference in sound quality between a meeting of ten people and a meeting of 230.

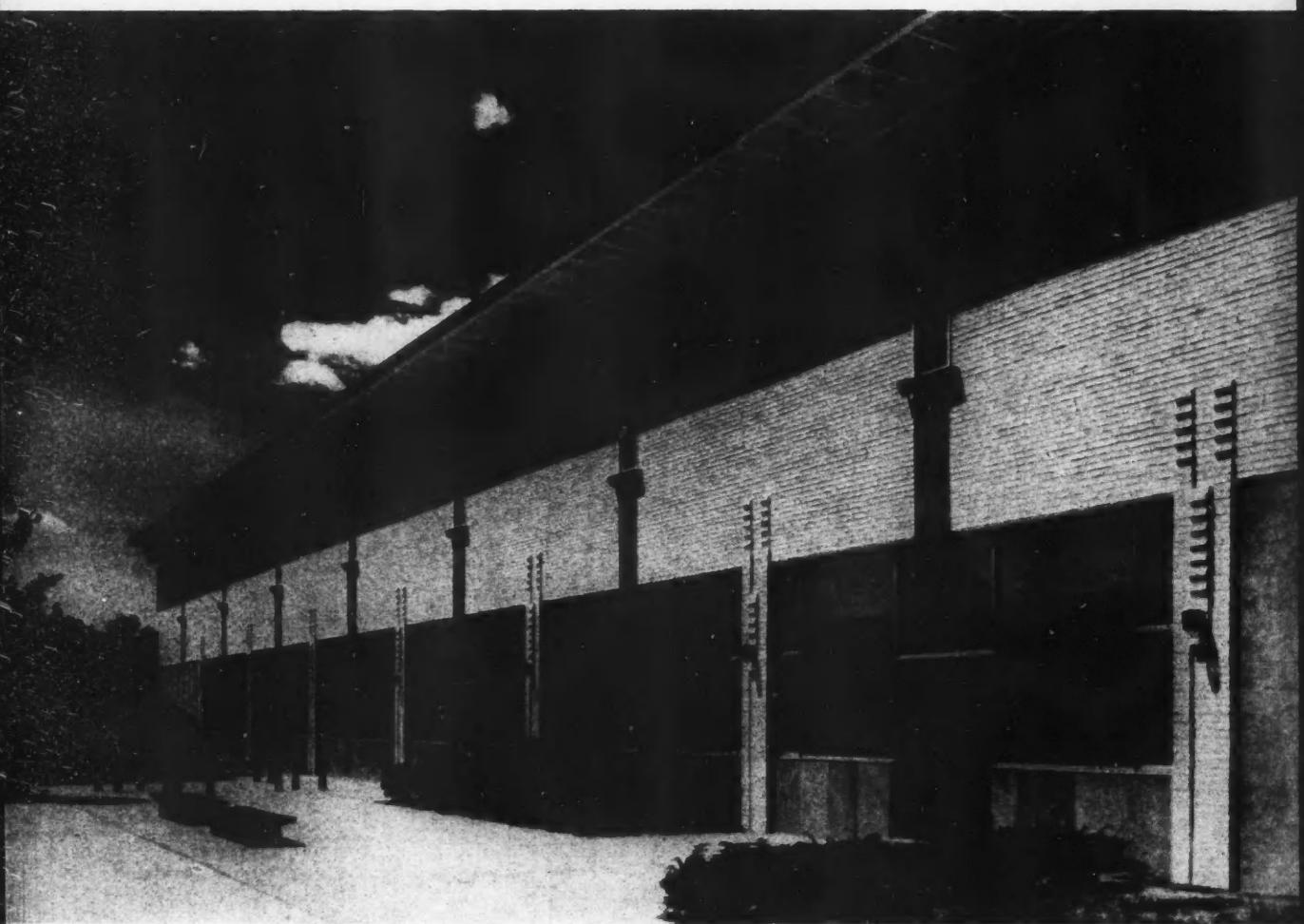
Plan of third level at right is typical. Library is above cafeteria; kitchen is below. Wings step down one floor each with site so that level three is top floor of wing D. This saves level ground for parking designed at 70 cars per 100 people. Cores at wings A and C contain stairways, elevators, rest rooms, duct risers, etc.

Glass-enclosed stairways at the ends of wings can be detached and moved outward to allow add-on construction



## ARCHITECTURE AND NATURE COMBAT INDUSTRIAL BLIGHT

*Architects, engineers, and industrialists are joining forces with the gifts of nature in the "dream of a true industrial neighborhood in Farmington Industrial Park, where dignity of man shall never be subservient to machines"*



*Connecticut Spring Corporation  
Farmington Industrial Park  
Farmington, Connecticut*

*Walter F. Greene Jr., Architect*

*Loomis and Loomis  
Structural Engineers*

*Burton and Van Houten  
Mechanical Engineers*

*Maine and Tillapaugh  
Land Planning Consultants*

*Abel Construction Company, Inc.  
General Contractors*

*Robert L. Nay photos*

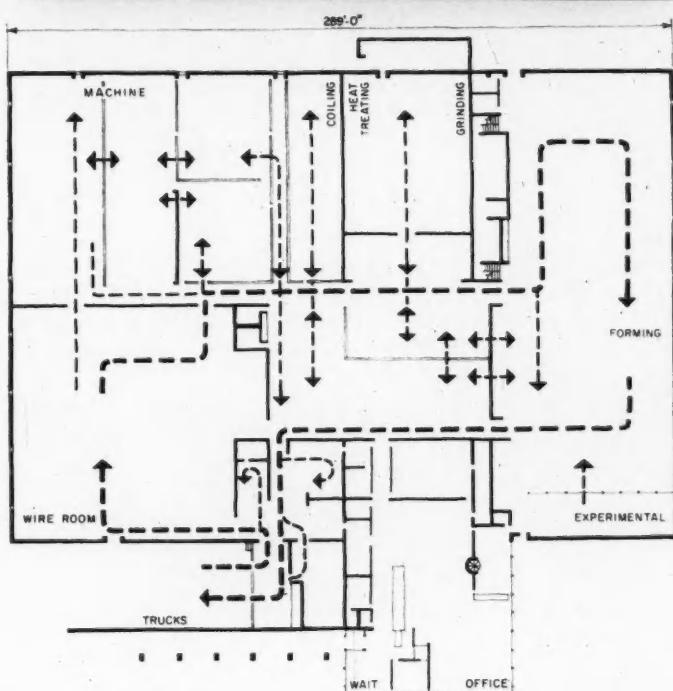
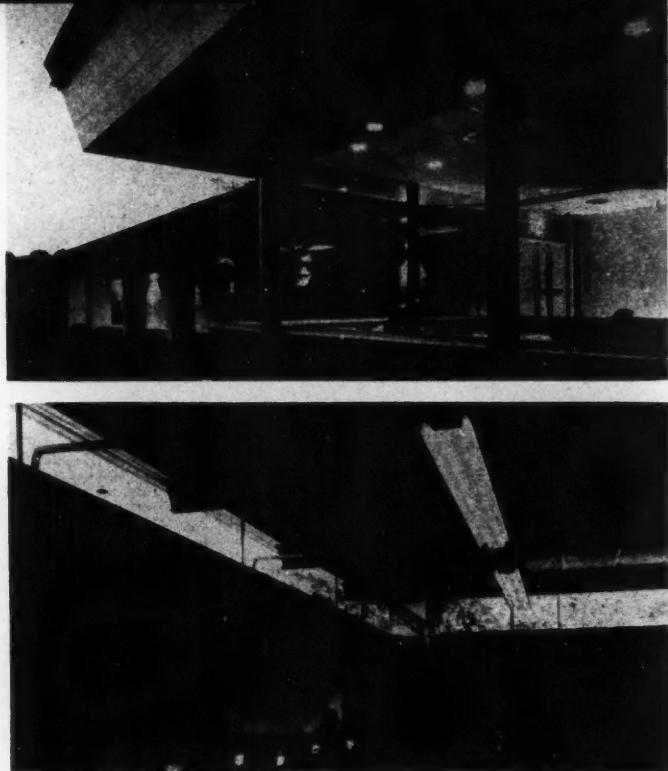




First of some fifteen or twenty plants to be constructed on a 150-acre site of rolling hills and woodland, this spring factory, home of the park's owners, sets a standard of design and quality. Other buildings will be variously designed around their purposes, but all will be coordinated by a planning team to relate to each other and to the park. All will be fully air conditioned. And all will be landscaped into their sites as naturally as possible.

The program for Connecticut Spring Corporation required a factory to make many kinds and sizes of specialized springs. Some products move through many departments; others only one. Large repeating orders are mixed with small specialized ones. Flow must be free in several directions with special attention to production and quality control. The solution is a very simple building block, expandable in two directions, completely flexible, with mechanical services located overhead.

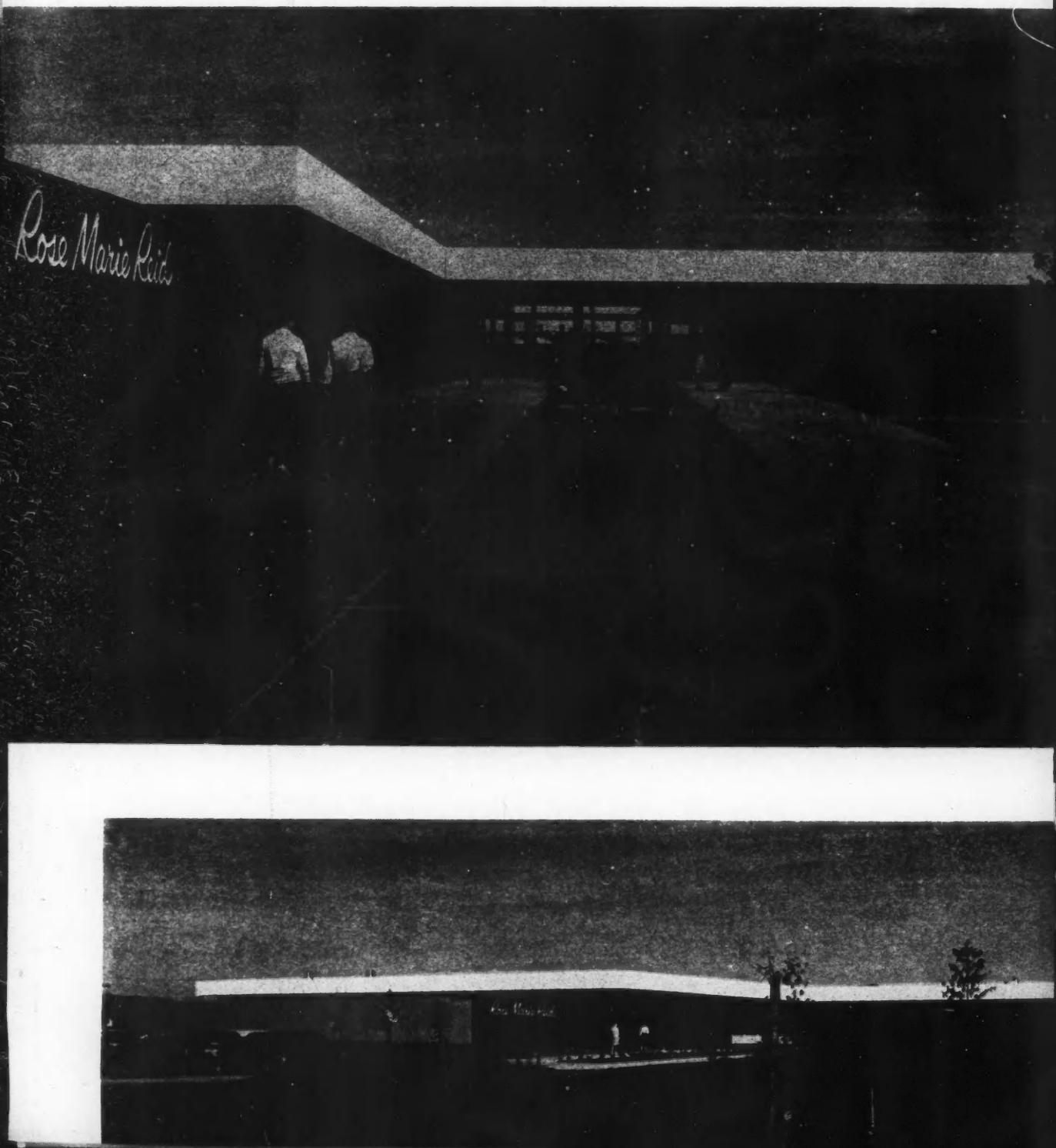
Structure is a double cantilever system with 25 by 40 ft bays and all steel held free from masonry walls.

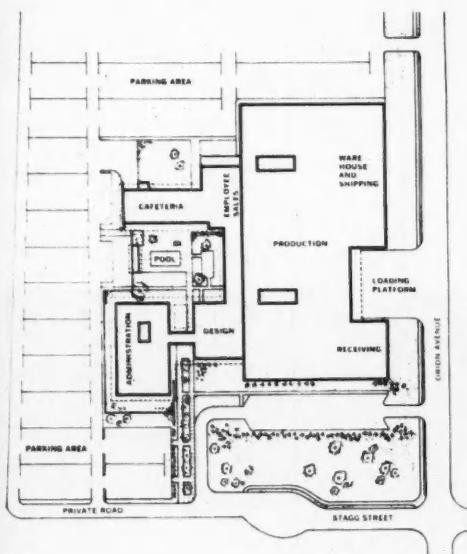


*Industrial Buildings*

## COLORS, COURTS, AND POOL ADD FLAIR TO SWIMSUIT PLANT

*Extensive roof overhang, generous use of wood and gay colors, and careful scaling of wings surrounding a demonstration swimming pool impart a country club air to a swimsuit plant with landscaped courts on view inside and out*





One of the architect's primary assignments in design of the Rose Marie Reid plant was to keep it low and carry into his design the client's advertised reputation for "flair".

Based on an analysis of function, departments are grouped in a series of wings so that an almost residential character is achieved. Wings are arranged around a landscaped patio featuring a swimming pool used for product testing and weekend recreation for employees. In the factory area, two glass enclosed, 20 by 60 ft. landscaped courts are visible from all points.

Building is fully air conditioned. Framing is steel, brightly painted, with tapered girders spanning 60 ft at 20-ft intervals. Walls are tilt up concrete with pebble finish. Cafeteria and reception areas are glass enclosed. Floors are concrete with asphalt or vinyl tile.

Marvin Rand photos



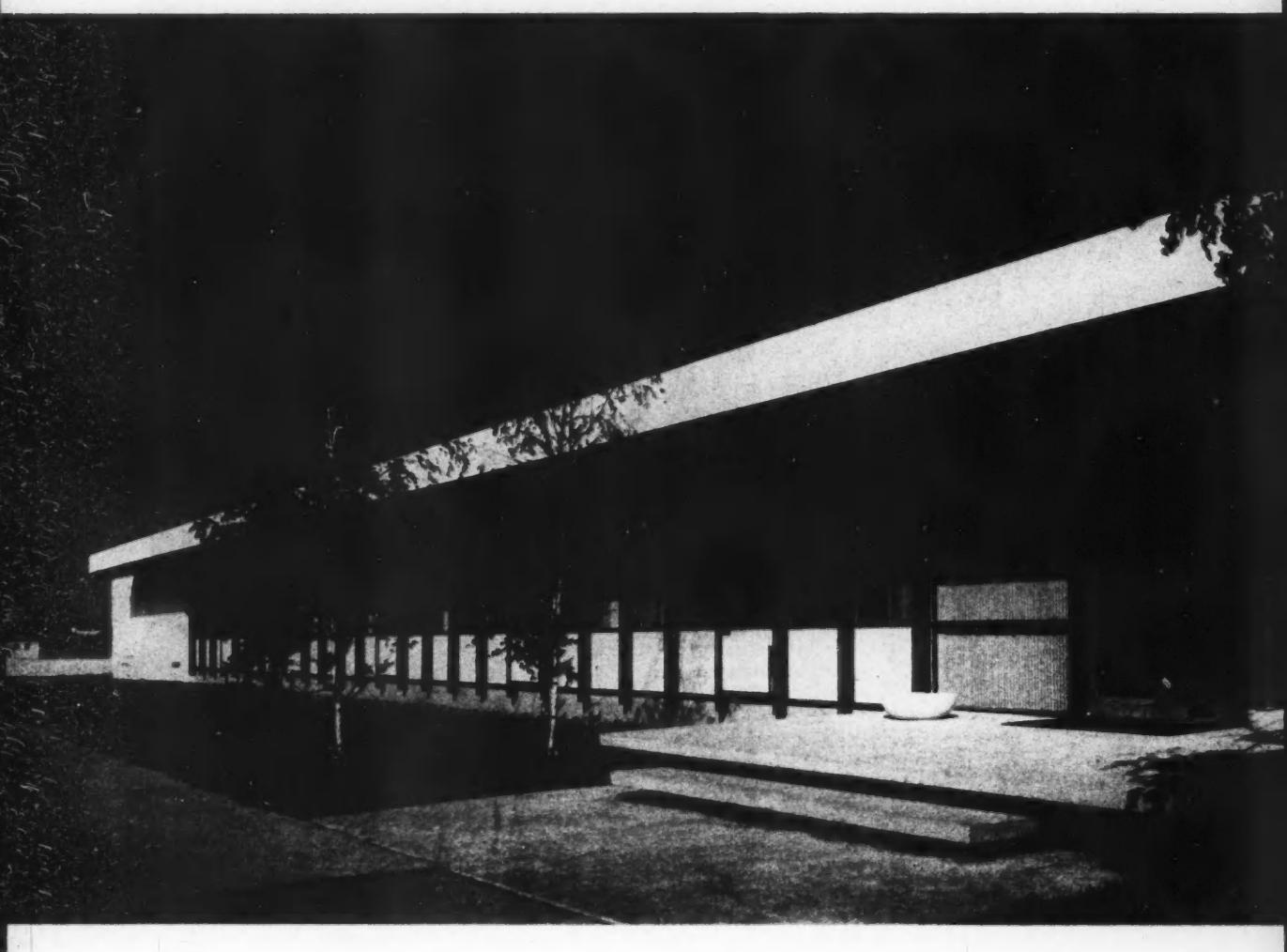
*Rose Marie Reid, Inc.  
Van Nuys, California*

*Victor Gruen Associates  
Architects and Engineers*

*Conant and Lieberman  
General Contractor*

## PLANT IS DESIGNED AROUND PRODUCTION FLOW LAYOUT

*Designed for direct flow of materials and flexibility of production layout with provision for future expansion of the building, this one-floor plant has more capacity than about the same area in former nine-floor quarters*



*Edwin J. Schoettle Company, Inc.  
Folding Carton Plant and Offices  
Upper Gwynedd Twp., Pennsylvania*

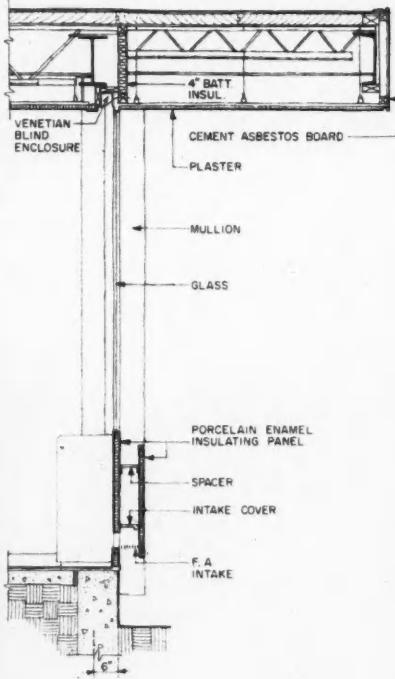
*Vincent G. Kling  
Architect*

*McCormick-Taylor Associates  
Structural Engineers*

*Stewart A. Jellett Company  
Mechanical Engineers*

*Wark and Company  
General Contractor*

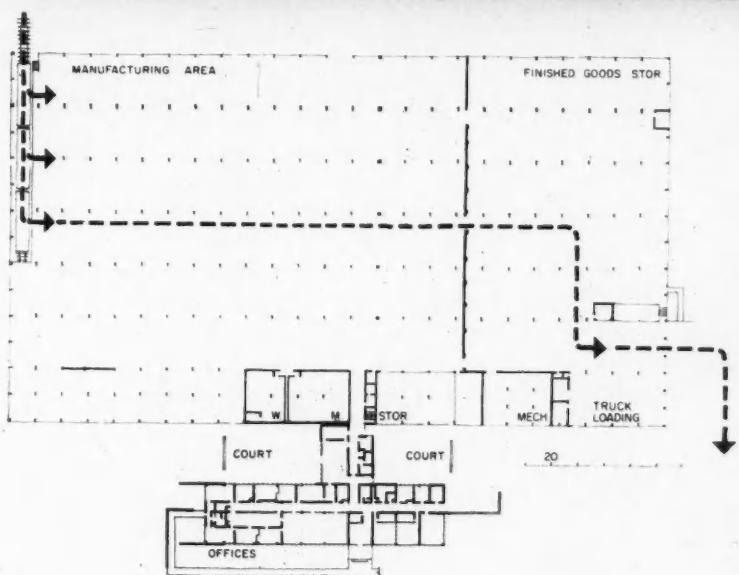
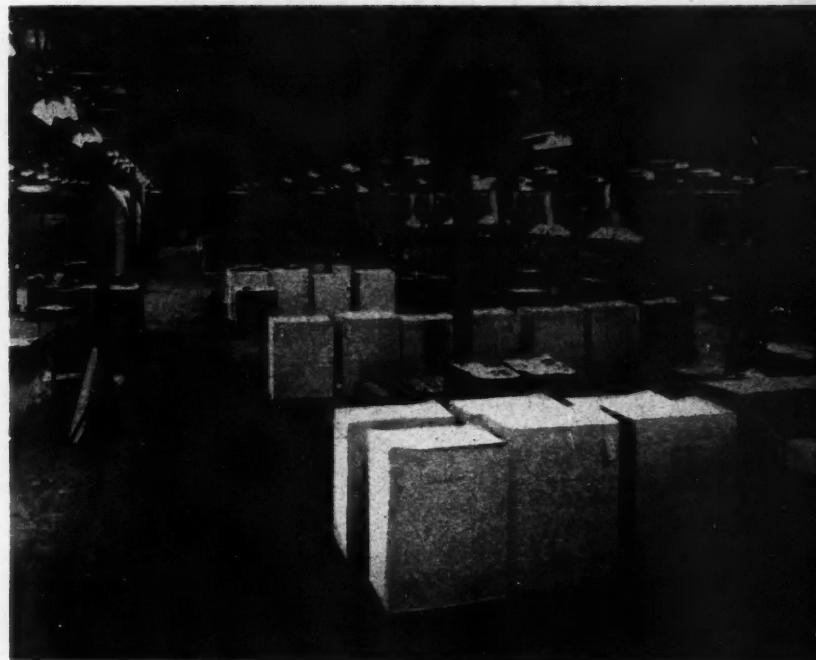
*Lawrence S. Williams, Inc. photos*



Site requirement for this paper box plant called for rail delivery of raw materials and trucking access for highway distribution of finished products.

The plant building is a 145,000-sq ft rectangular open space designed to house a pre-established production pattern. Three box cars can enter the building on the west side. Flow is through cutting, printing, waxing, creasing, etc., with parallel pneumatic scrap removal, to finished storage, scrap baling, and shipping on the east. Wall divides humidified production area from storage.

Structure of office wing and plant is steel frame with precast roof planks on bar joists. Plant walls are vertical insulated metal panel. Office walls are fixed glass with porcelain panels below. At air intakes for unit heater-coolers, porcelain cover panels (see above) are set flush with mullions creating self-color highlights.



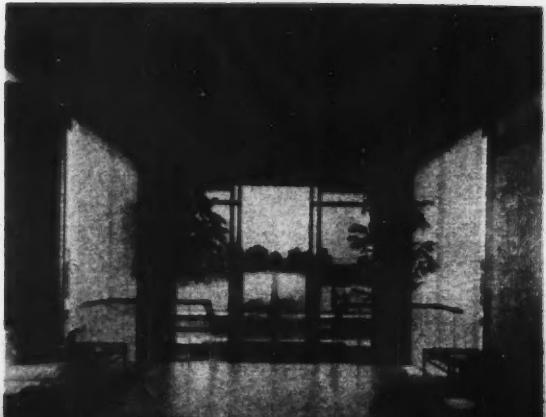
## ADDITIONS PRESENT NEW FAÇADE ON AN ESTABLISHED SITE

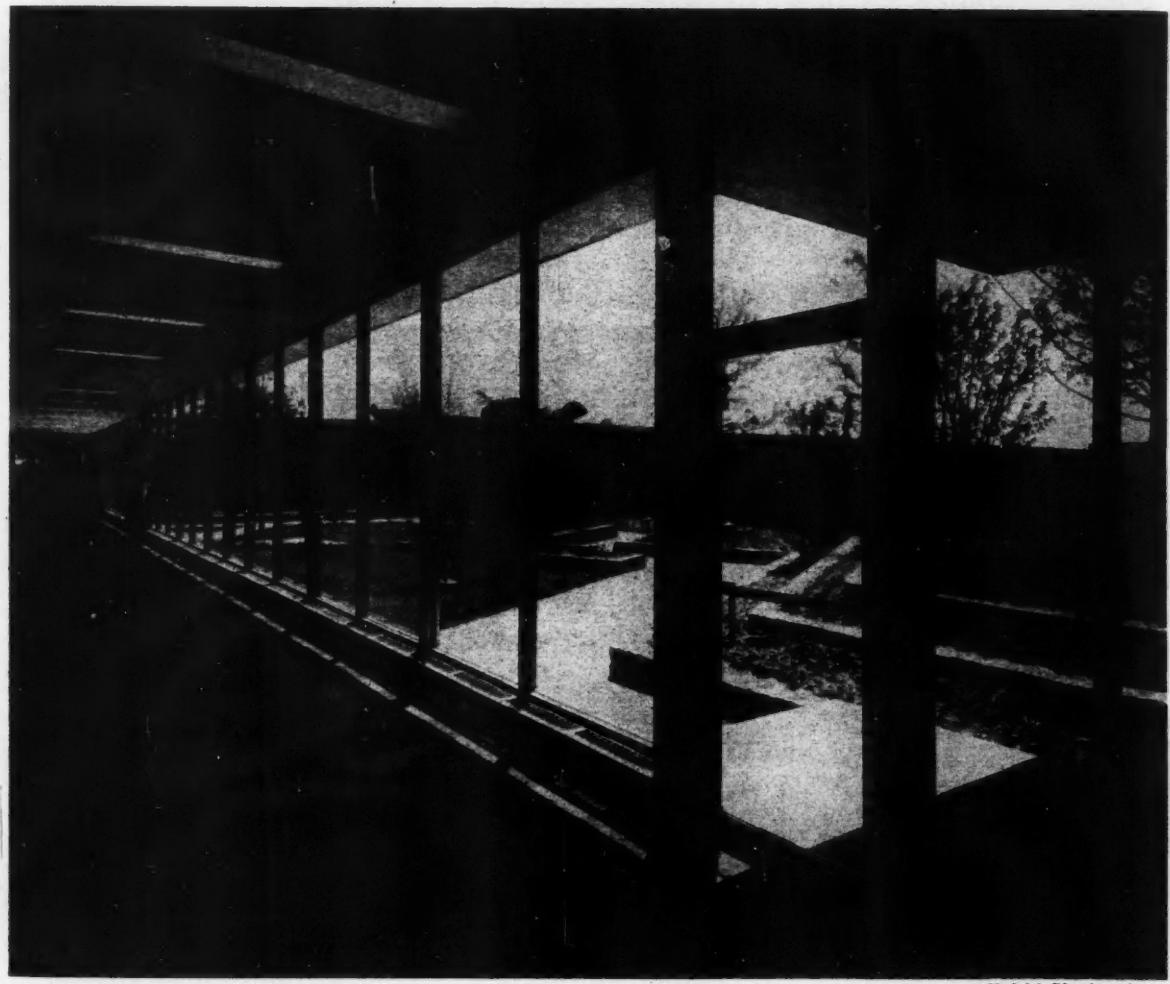
*Expansion of facilities at a Simmons mattress plant completed architectural development of a suburban site, reoriented frontage with new glass curtain walled offices, trebled the working area, streamlined metal furniture production*

*Simmons Company  
Munster, Indiana*

*A. Epstein and Sons, Inc.  
Engineers and Architects*

*Pathman Construction Company  
General Contractors*

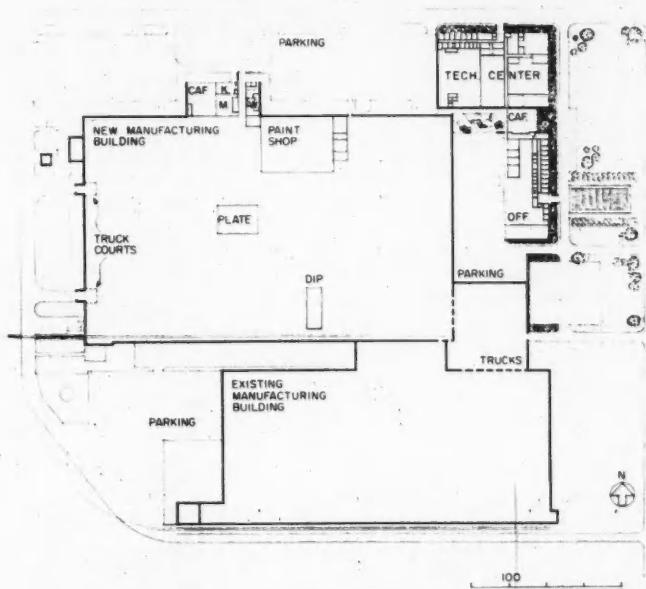




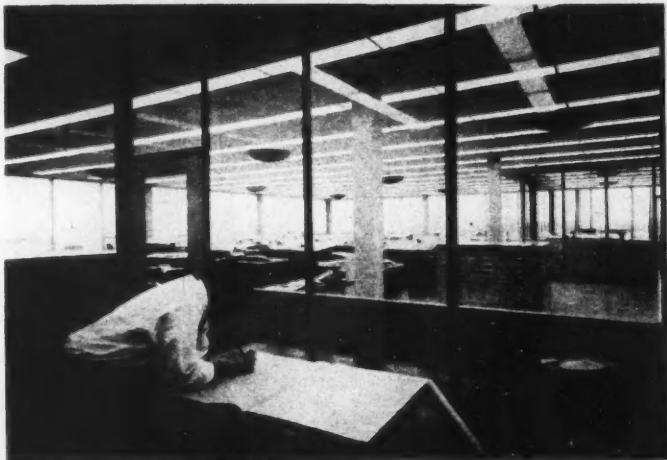
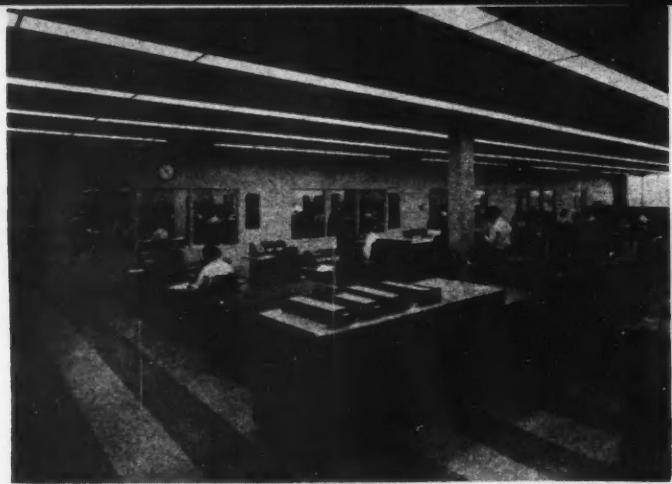
Hedrick-Blessing photos

Three new buildings, consolidating Simmons' midwestern operations, have added offices, an engineering center, and a metal working plant for hospital beds and furniture to an existing plant. Offices and technological center face the main thoroughfare and are set back about 150 ft from the street line. Landscaped frontage includes a 60 by 120 ft reflecting pool directly in front of the main entrance. The pool doubles as a cooling tower for the air conditioning system which serves both buildings. Between buildings is a glass enclosed cafeteria facing, on the west, a large landscaped patio. This in turn is edged by a glazed walkway (above) leading to the manufacturing plant. Fenestration of offices and technological center is clear continuous glass 7.5 ft high with colored glass spans.

*continued on next page*



## Industrial Buildings



### Simmons Company

drills top and bottom. End walls are face brick.

Manufacturing area (687,322 sq ft) has a minimum of 19 ft clear height with bays 30 by 40 ft. Structure is steel frame, poured gypsum roof deck, columns on caissons, aluminum insulated panels enclosing walls. Cranes and conveyors transport metal furniture from raw steel to spray painting and finally to ovens located on the roof.

Heating is by high temperature high pressure water from four boilers in a southeast annex of the old plant. Lighting is high intensity fluorescent. A fully automatic sprinkler system, smoke detection devices and hose stations give fire protection. There is a fire wall around paint areas.

A second kitchen and cafeteria are located in the manufacturing area, and toilet facilities are located on mezzanines throughout the plant as are offices for supervisory personnel.

# Architectural Engineering

## Integrating Lighting, Heating and Cooling

In many buildings today, particularly office buildings and schools, the problem much of the time is not how to heat them, but how to get rid of heat from people, business machines and lights. In an office building with 100 footcandles of general illumination, the lighting load can account for approximately 42 per cent of the total air conditioning requirements. Obviously with lighting levels of this magnitude and higher, more efficient means have to be found for removing the heat from the equipment. A special issue of *Illuminating Engineering* (August 1961) on "Integration of Lighting, Heating and Cooling" examines the nature of the problem and suggests approaches to help lessen the air conditioning load.

## School Lighting Guide

## Residential Heating, Cooling Loads

## Progress in Steel Structures

## New Building Research

## This Month's AE Section

The Illuminating Engineering Society reports that the IES Council has approved a new *Guide to School Lighting* which is to be submitted for approval as an American Standard (American Standards Association). Described as a non-technical document, the *Guide* is expected by IES to be published within a few months.

*Load Calculation for Residential Winter and Summer Air Conditioning* is the title of Manual J just issued by the National Warm Air Heating and Air Conditioning Association providing a single load calculation designed to be simple to handle, yet accurate. The manual is an outgrowth of two years' work by the Load Calculation Committee of NWAHACA and the combined efforts of the Industry Heat Gain Joint Study Group which included, in addition to NWAHACA, the Air Conditioning and Refrigeration Institute and The Institute of Boiler and Radiator Manufacturers. A main feature of the new manual is the "family-type" grouping of construction assemblies to reduce the factors from 4400 for heating only in former manuals, to 1000 for both heating and cooling. The manual is available from NWAHACA at 640 Engineers Building, Cleveland 14, Ohio, for \$2.50.

More evidence of advances in structural steel framing for buildings comes with the announcement of prize winners in the \$25,000 Awards Program sponsored by the James F. Lincoln Arc Welding Foundation—a professional competition for the design of machines or structures using arc-welded steel. Third Award went to Peter P. Petkoff, Chief Structural Engineer and Lin Y. Huang, Senior Structural Engineer for Minoru Yamasaki—Smith Hinchman & Grylls, Associated Architects and Engineers, on the use of direct butt-welded, beam-to-column connections in the 28-story Consolidated Gas office building; savings in steel of 10 per cent over riveted connections were reported. Among other structures included in the awards were: a laminated steel hyperbolic paraboloid roof for a restaurant; a folded steel plate roof for a branch bank; all-welded grid trusses for a new library at Yale; composite welded steel and concrete shell roof for a drive-in bank; cantilever truss for the retractable roof of the Pittsburgh Public Auditorium; structural steel folded plate roof for a bowling alley; and a hyperbolic paraboloid of welded steel decking.

"Needed Research on the Effect of Building on Human Behavior" is one of seven papers just published by the Building Research Institute covering a conference on New Building Research, Fall 1960, held as part of the 1960 Fall Conferences. This paper describes a project centered in the Department of Architecture at the University of Michigan and sponsored by the Educational Facilities Laboratories of the Ford Foundation which has as its first goal the searching of literature and making an inventory of what is known about the effect of the environment on learning. Included under environment are the atmosphere, light, sound, spatial arrangement and social groupings; human behavior covers physiology, perception, mental reactions, performance and learning. This publication is available from Building Research Institute, 2101 Constitution Ave., Washington 25, D. C. for \$6.00.

**SPACE STRUCTURES IN STEEL**, p. 190. **TIME-SAVER STANDARDS**: Space Frames, p. 195. **DETAILS CUT MECHANICAL AND ELECTRICAL COSTS**, p. 197. **BUILDING COMPONENTS**: Plastics for Building, p. 203, *Products*, p. 205, *Literature*, p. 206.

# SPACE STRUCTURES IN STEEL

by Robert E. Rapp,  
Regional Engineer,  
American Institute  
of Steel Construction, Inc.

While grid and space frameworks are not new in concept, or even in practice, they have not been extensively used in this country.

But since the list of applications is beginning to grow, it is important that the architect and engineer be aware of the availability of information on the design of these frames, be able to distinguish types of systems, and be conscious of the considerations involved in their structural designs.

There are many types of space structures. These take the general form of the simple monolithic grid, double layer grid and coplanar systems (folded or curved structures).

## GRID SYSTEMS

A grid framework can be described as a continuous monolithic plane system usually symmetrically tied together by a series of longitudinal

Space frames are not new in concept, but interest in them is greater now with growing sophistication in structure. The basic idea, of course, is to obtain greater structural efficiency and potential cost savings. This article shows the many variations possible, discusses problems in analyzing these structures and gives several current examples. The Time-Saver Standards on pp 195 and 196 discuss the geometry and analysis of space frames in some detail

and transverse members to resist all applied forces acting normal to the system's plane.

The most common of these grids are the rectangular and diagonal types. The diagonal arrangement is commonly referred to as a "diagrid." The diagrid is the most popular because of its greater rigidity as compared to the rectangular grid system. Figure 1 shows layouts of various grid patterns most frequently occurring in practice. It is apparent from the geometry of the different systems shown that the analysis and fabrication costs would be less for the rectangular or diagrid arrangements than for the other types illustrated.

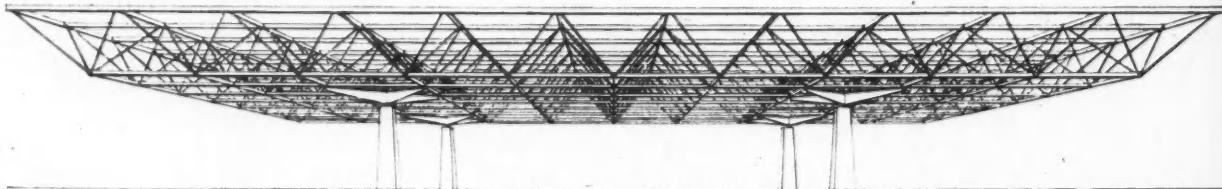
John Hotchkiss, Senior Regional Engineer for the AISC, in a paper on lamellas, diagrids and arches has cited the following advantages of grid construction:

- 1) Considerable reduction in required structural depth,
- 2) Avoidance of main beams and girders,
- 3) Notable saving in steel,
- 4) Simplification of fabrication due to repetition of members.

He pointed out further that a hypothetical grid system measuring 45 by 75 ft with no internal column support weighed 20.3 tons as compared with a weight of 26.6 tons for a floor system of girder and beam design—a saving of 6.3 tons of steel. In addition the grid system had a required depth of 18 in. as compared to a 36 in. depth for the conventional design. With a depth difference of 18 in. the architect and engineer could imagine what the saving in height might be for multi-story buildings in which large column-free areas are required.

Grid systems are noted for their

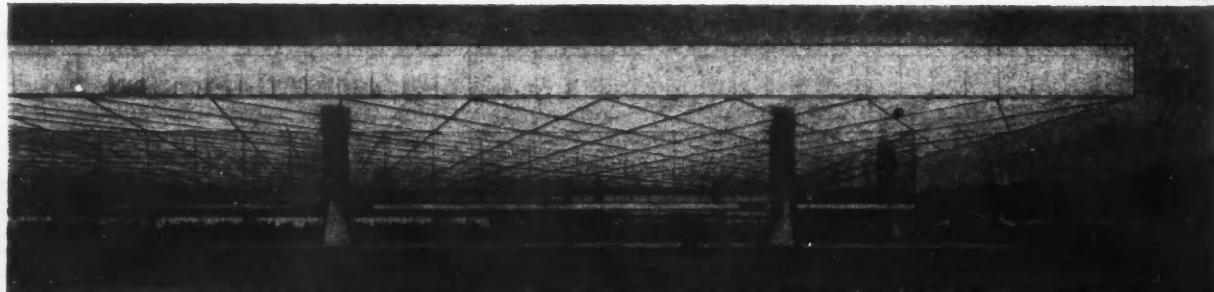
## TWO PROPOSED SPACE FRAME DESIGNS



Structural steel space frame for a high school in Peoria, Illinois covers an area of 280 by 168 ft, has a 28-ft cantilever, and

is 14-ft deep. Foley, Hackler, Thompson and Lee, Architects. The Engineers Collaborative, Structural Engineers

Ara Derderian



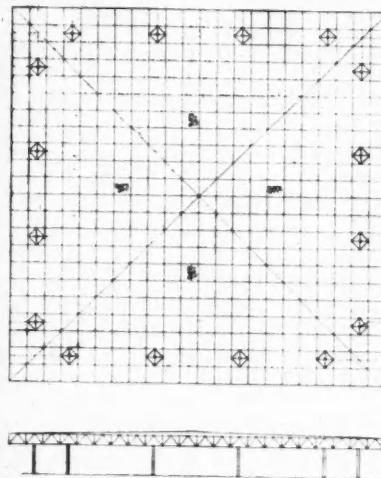
Competition winner for multi-airlines terminal at New York International Airport. Frame is 625 by 225 ft, spanning 200 ft between columns. Designed for pre-assembled steel tetrahedrons, the frame is tied together at the top by a reinforced

concrete slab and at the bottom by tension cables in the central area, changing to steel compression members around columns. I.M. Pei & Associates, Architects; Ammann & Whitney, Structural Engineers

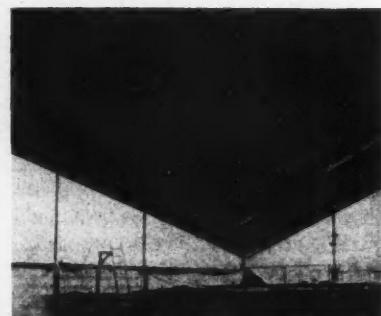
A RECTANGULAR DOUBLE-LAYER GRID



Roof structure of Cadet Dining Hall for Air Force Academy consists of 23 Warren trusses intersecting at right angles to cover an area 308 ft square. Skidmore, Owings & Merrill, Architects and Engineers



FOLDED-TRUSS ROOF



Folded roof for a high school gym in Littleton, Mass. is framed with structural steel shapes. The Architects Collaborative, Architects; Goldberg & LeMessurier, Structural Engineers

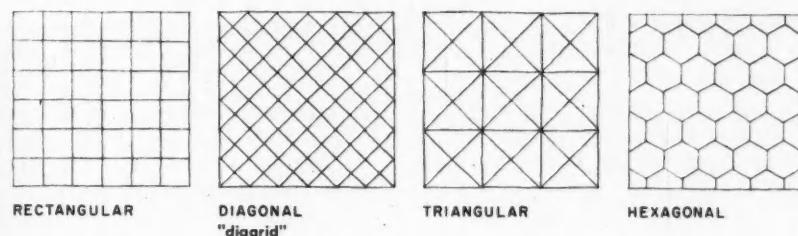


Figure 1. Grid Patterns Used in Structures

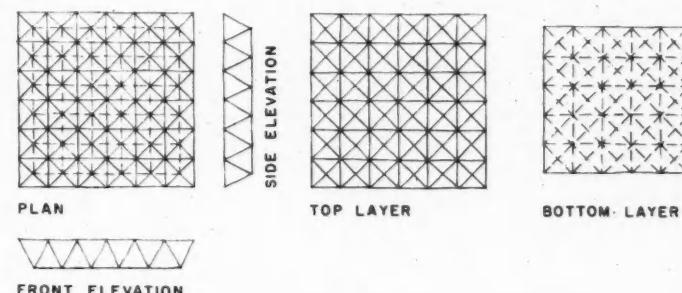


Figure 2. Typical Double Layer Grid System

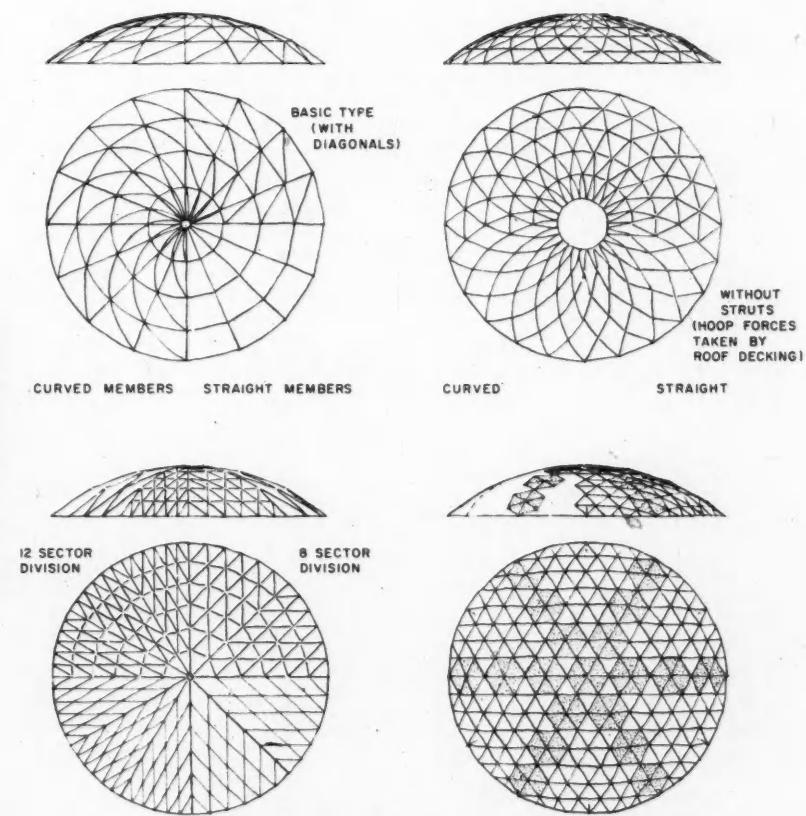


Figure 3. Dome Designs Incorporating Grid Patterns

## Space Structures

ability to distribute loads throughout their interconnecting members. It is distribution of stress which allows large areas to be covered without internal columns.

The monolithic plane grid framework is normally erected as a roof or floor system. Interconnecting members are commonly fabricated of uniform cross-section. Monolithic two-way grids form an ideal roof or floor frame for earthquake-resistant structures in which the floor and roof elements have to transmit horizontal forces. Such grids provide many paths for these forces.

As greater unsupported areas are required, it may be found that the monolithic grid system becomes too cumbersome. The designer may then resort to the double-layer grid. A typical double-layer grid is shown in Figure 2. These three-dimensional planar systems are designed in many geometric patterns and have many names describing them; however, this writer prefers to call these frames "double-layer grid structures" as they are referred to by Dr. Z. S. Makowski in his paper published by the *Architectural Association Journal*, March 1961 (London). Dr. Makowski has done considerable

research on many types of grid spatial structures.

These double layer systems are suited for structures under the action of heavy concentrated loads, and, like the monolithic grid systems, allow the engineer to take full advantage of repetition of members and prefabrication.

### DOMES, ARCHES, FOLDED PLATES

The discussion thus far has been mainly about monolithic planar systems. Space structures often take the form of co-planar grid systems in the form of domes, arches, valley-ridge arrangements and other more complex spatial form.

From Figure 3, dome designs incorporating grid patterns can be classified as the following types:\*

- 1) Schwebler Dome.
- 2) Lattice or Lamella types.
- 3) Parallel Lamella systems.
- 4) Hexagonal systems.

This space frame is defined here as a multi-planar continuous framework which acts simultaneously in three dimensions to resist all applied forces. Space frames not only take the form of arches, and domes, but also can be constructed as spatial

grids and rigid frame bents in many different patterns.

Figure 4 shows some typical designs incorporating spatial grid arrangements.

Greater spans may be achieved with this folded plate, spatial grid method by utilizing what German engineers call a rhombic truss. The author prefers the term lattice girder. These girders are truss arrangements with interlaced, interconnecting members as shown in Figure 5 (a). Although these lattice sections are indeterminate, the idea is simply to provide a method for cutting down the  $l/r$  stiffness ratio of the truss chords and interconnecting members. This enables the engineer to design long span spatial truss arrangements constructed of relatively lightweight steel. Economical column-free spans up to 300 ft can be designed with lattice sections. For example, if lattice sections are laid in a simulated valley-ridge arrangement such as folded plates, one-story buildings can be made column free internally for widths up to 300 ft, and for lengths along the gable section to infinity. Figure 5 (b) shows typical double-layer spatial grid gable sections for long-span construc-

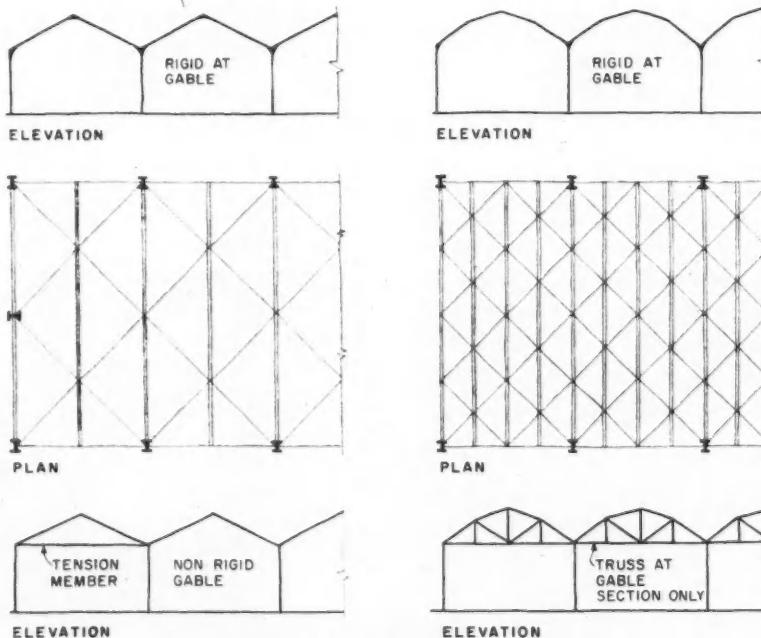


Figure 4. Two Typical Determinate Spatial Grids.

### Definitions

#### GRID FRAMEWORK

A continuous monolithic plane system generally symmetrically tied together by a series of longitudinal and transverse members to resist all applied forces acting normal to the system's plane.

#### SPACE FRAME

A multi-planar continuous framework which acts simultaneously in three dimensions to resist all applied forces.

#### LATTICE GIRDER

An indeterminate truss system consisting of internal tension and compression members arranged in a grid pattern tying together the upper and lower chords so as to resist applied forces acting in line with the system's plane.

tion: valley ridge; barrel arches.

Spatial grids may be used for circular dome sections with the folded plate method. Figure 6 shows these members forming a valley-ridge, pie-shaped sectional arrangement terminating at a compression ring in the center of the structure. The individual truss sections may be designed as determinate members, or as lattice members where greater spans are required.

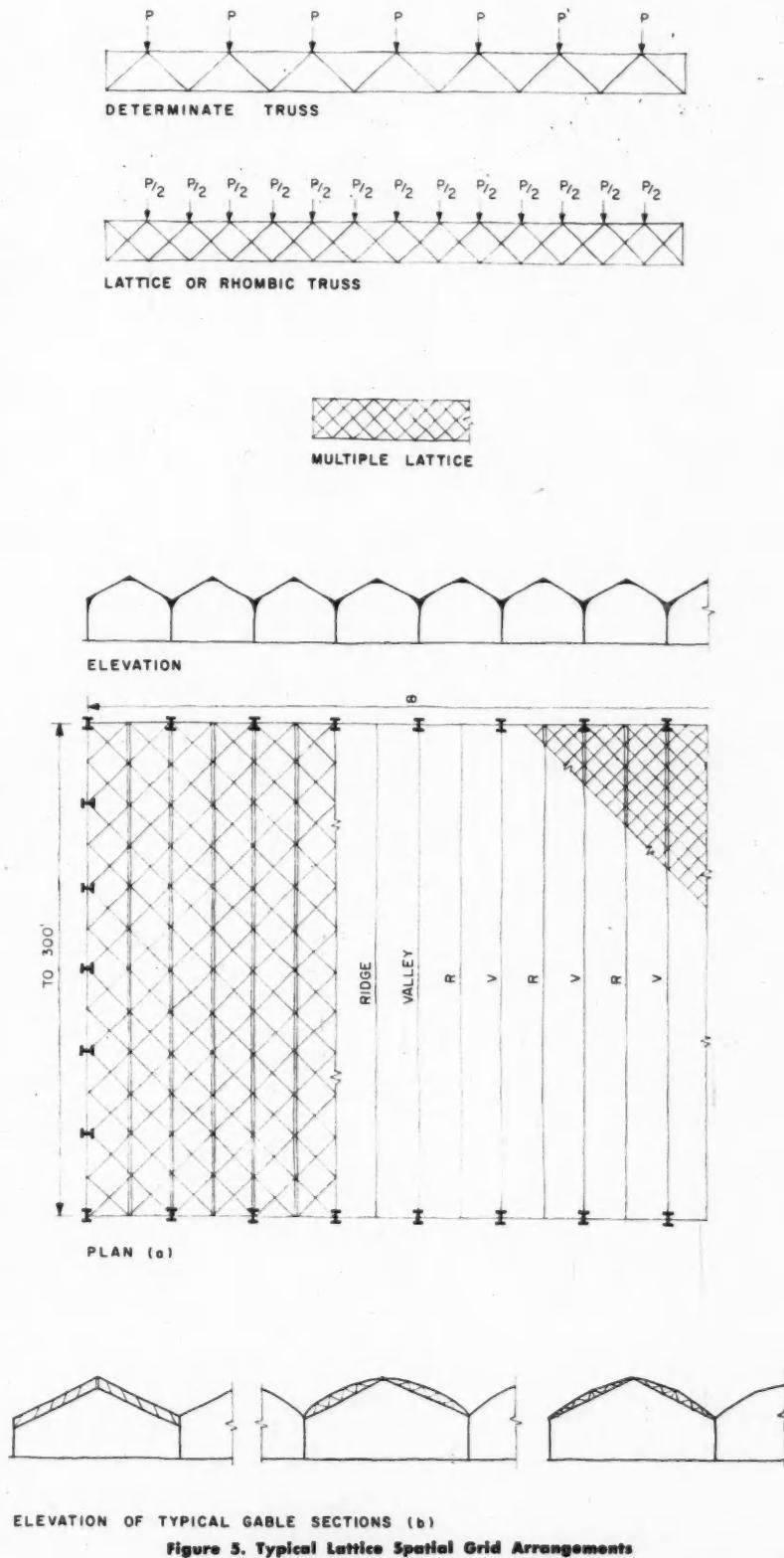
Axial forces are the prime concern in spatial grid arrangements. But in addition, the vertical loading conditions for bending must be investigated. Methods for determining axial and bending forces in determinate sections are covered in a very timely paper on a "Steel Frame Folded Plate Roof" by Oliver A. Baer shows the simplicity of designing these frames by statically determinate analysis. (American Society of Civil Engineers, *Journal of Structural Division Proceedings*.)

#### PLASTIC DESIGN

The author was asked recently if a ridged frame dome could be designed plastically. The structure in question was a circular shaped building divided into a 12-sided polygon with a diameter of 100 ft. The columns were 20 ft high. A typical section was analyzed. It was found that 14 WF 30 beams and columns were required to carry a uniform dead and live load of 70 lb per sq ft. Figure 7 shows the simple plastic analysis in algebraic-geometric form. Similar analysis may be performed for different dimensions and loading conditions.

A very good publication on the use of plastic analysis pertaining to grid frameworks is *Plastic Analysis of Structures*, Philip G. Hodge Jr., McGraw-Hill Book Co., Inc., 1959.

The most simple of the monolithic or co-planar grid-space systems are highly complex to analyze. If exact analysis is necessary, this complexity may be greatly reduced by assuming the joints as hinge-connected instead of rigid. Also, by ignoring the torsional forces the number of design calculations may be cut. Analysis of monolithic grids is discussed in "An



\*These were discussed by Seymour Howard in Time-Saver Standards on "Metal Domes", AR, Nov., Dec., 1960

Figure 5. Typical Lattice Spatial Grid Arrangements

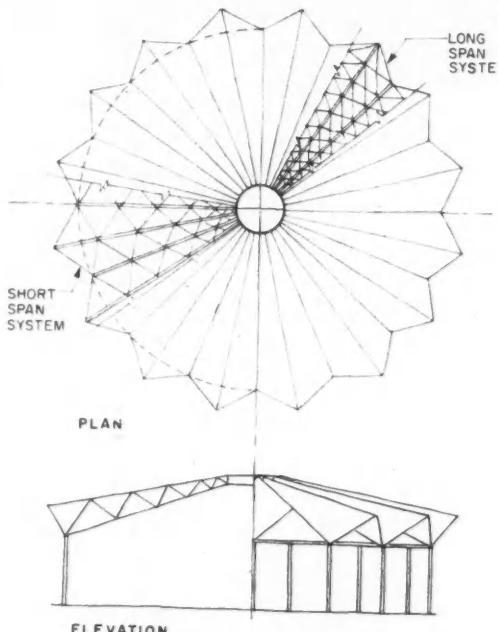
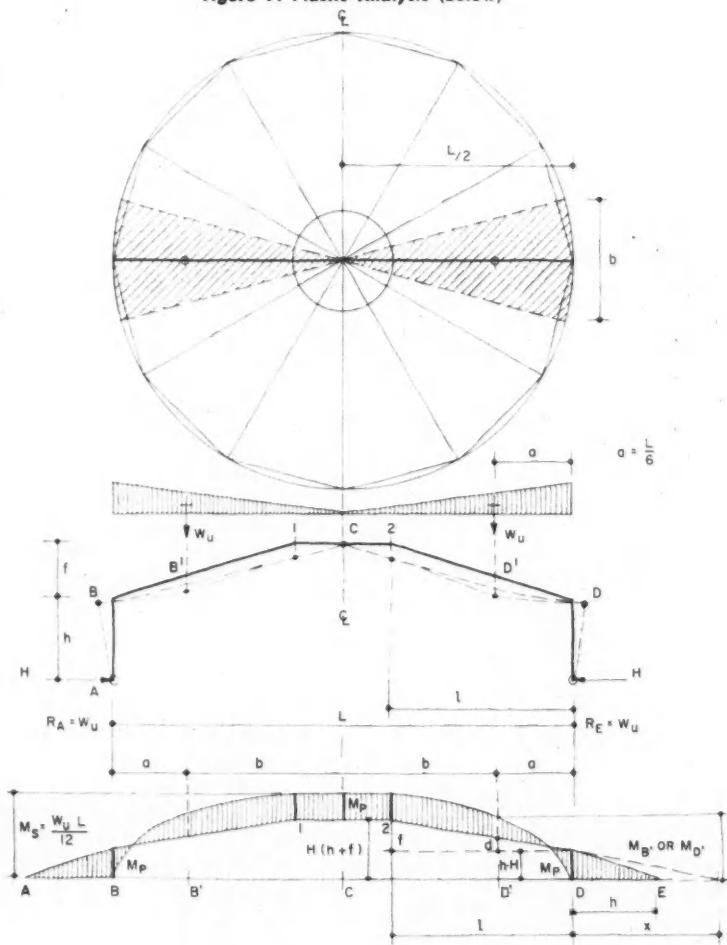


Figure 6. Rigid Frame Dome (Above)

Figure 7. Plastic Analysis (Below)



$$w = 1b/f_1^2$$

$$w = \left(\frac{L+b}{2}\right) w$$

$$w_U = 1.65 \cdot \left(\frac{L+b}{2}\right) w$$

$$\text{Solve: } M_P = h \cdot H = \frac{W_U L}{12} - H(h+f)$$

$$M_B = M_P = \frac{1}{2} W_U (a - 2 \frac{a^2}{L} + \frac{4}{3} \frac{a^3}{L^2})$$

$$\text{CHECK } M_B = H(h+d) \leq M_P$$

$$d =$$

$$h \cdot a/x$$

Analysis of Open Grid Frameworks" by Dr. Makowski. His method permits the designer to solve a rectangular or diagrid frame in a matter of minutes. Dr. Makowski gives constants in chart form for determining moments, shears and deflections.

If the analysis is simplified by assuming the nodes hinge-connected, calculations will be on the conservative side. If lightness of the structure is the prime factor in design, however, the engineer must resort to more exact analysis. In this case the nodes would be assumed to be rigidly connected and all forces, moments and deflections would be considered. This analysis is highly redundant, especially with the co-planar or double layer systems. Where many contemplated complex designs are anticipated, it would probably be better for the designer to develop an electronic computer program. [Model analysis has been used where edge loading conditions were complicated and varying—Ed.]

The steel industry has made available new high-strength, low-alloy steels such as A440 and A441 which have yield strengths of 50,000 psi in rolled shapes and plate thicknesses to  $\frac{3}{4}$  in. Another high-strength, heat-treated steel is now available in structural shapes with yields in excess of 100,000 psi.

Steel is available now with controlled properties and yield strengths ranging from 33,000 psi to over 100,000 psi.

Engineers can appreciate the structural advantages in conventional uses of these steels, let alone the advantages they may achieve with their use in space and grid frame design. And the architect can visualize the lightness in design possible.

Design tools are available to the engineer through a storehouse of reference material. It remains only for the architect and engineer to use these materials and apply these tools to open up space with structure.

The American Institute of Steel Construction has prepared a bibliography of some 30 references on grid and space frames. It is available without charge from: American Institute of Steel Construction, Inc., 101 Park Ave., New York 17, N. Y.

**SPACE FRAMES: 1**

by SEYMOUR HOWARD, Architect, Associate Professor, Pratt Institute

Space frames as defined here are essentially three-dimensional trusses. Known also as lattice structures, space frames may be thought of as three-dimensional equivalents of commonly used plane trusses.

**Nature of Members**

Just as with a plane truss, roof or floor decking and other elements should be arranged so that all loads are transferred to the joints of the truss. In that way all members of the truss can act as two-force members. Theoretically the members should have spherical (ball-and-socket) hinges at their ends—a most difficult condition to realize in practice. The construction of the joints, even with a certain amount of restraint, is a difficult and costly problem, and is, as a result, the principal basis for patents.

**Materials**

Space frames are typically built of steel or aluminum, but also may be of reinforced concrete, or even of wood if the joint problem is solved.

In order to simplify construction, the designer tends to use members of uniform size. If all the members are made of tubes of the same outside diameter, the wall thickness can be varied (although at considerable expense) to maintain uniform stresses in the material. Otherwise the majority of the members must be oversized in order that the most heavily loaded are not over-stressed.

**Depth**

The principal purpose of the depth of any structural assembly is to provide adequate moment arm between the upper and lower edges. The depths of space frames therefore correspond fairly closely to those of plane trusses under similar loadings. A single prismatic frame with heavy loads would require a depth of from  $\frac{1}{6}$  to  $\frac{1}{12}$  of the span. A complete floor system, however, with the top and bottom chords forming a two- or three-way grid similar to a system of closely spaced joists, would permit a minimum depth of  $\frac{1}{20}$  to  $\frac{1}{24}$  of the span.

**Determining Forces**

Most plane trusses used in

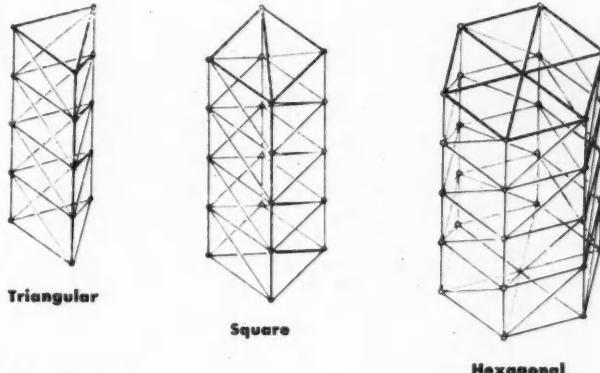


Figure 1: TOWERS

building construction are statically determinate, and the forces (bar stresses) found through equations of statics or Maxwell-Cremona diagrams are reasonably accurate. For three-dimensional trusses, however, even though statically determinate, the forces found through statics equations alone are often not sufficiently accurate for an economical design. Their configurations are such that one or more members at a particular joint would often be statically redundant for a given loading. The end condition of the joints must also be taken into account. Solutions based on energy equations are more satisfactory, but are tedious. Model testing is probably the best method, but it is also costly.

The basic geometrical unit in space frames, as defined here, is the tetrahedron, corresponding to the triangle in plane trusses.

The minimum number of members ( $m$ ) necessary for a rigid truss, is related to the number of joints ( $j$ ) by the following formula:

$$m = 3j - 6$$

Although the corresponding formula for plane trusses ( $m = 2j - 3$ ) is seldom used, since the triangulation can usually be checked by eye, the formula for three-dimensional trusses should always be used as a check on the number of members. The hexagonal, parallel-plane space truss shown in Figure 1, for example, would require at least three hexagons to

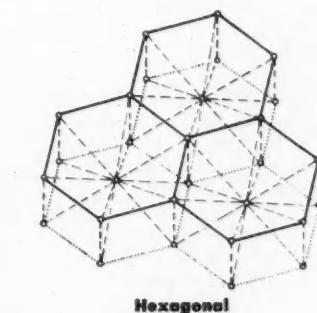
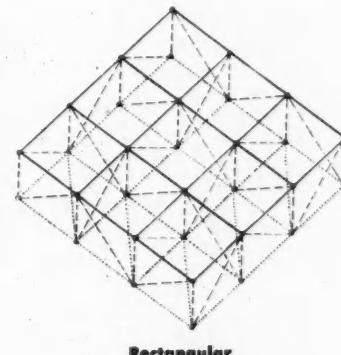
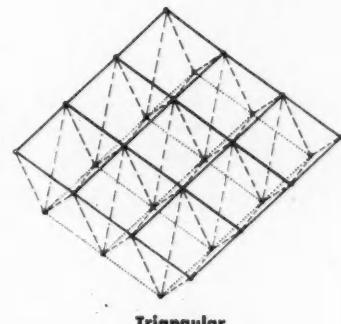


Figure 2: PRISMS

## SPACE FRAMES: 2

by SEYMOUR HOWARD, Architect, Associate Professor, Pratt Institute

satisfy the formula; the type S isometric space truss would require at least six squares in the upper plane.

This formula expresses a necessary condition for rigidity, but not a sufficient one. Some configurations meet this condition, but still permit deformation. For such configurations, additional checks such as the "zero-load test" should be made. (For an example see *Theory of Structures* by S. Timoshenko and D. H. Young, McGraw-Hill, 1945.)

## Types

The various types of space frames can be classified by the polyhedra from which they are built up.

For simple structures such as towers or isolated trusses, the space frame can be thought of as a single polyhedron. Any closed polyhedron whose faces are rigid (completely triangulated) must be itself rigid. Thus the triangular, square, and hexagonal towers shown in Fig. 1 can be completely hollow, provided the top and bottom planes are triangulated. The towers also can be hollow if they are laid on their sides as single trussed girders.

These three towers are drawn in axonometric projection. All vertical and horizontal members can be the same length; only the diagonals on the sides and across the top and bottom of the square must be longer.

In searching for a space-frame pattern suitable for a complete floor or roof, we need to investigate some of the lattices formed by the various space-filling polyhedra. We are interested in those lattices that give a level upper plane (floor) and a parallel lower plane (ceiling or floor). In Fig. 2 all the members in the upper planes are drawn with full lines. All those in the bottom plane with dotted lines, and those in between with broken lines.

The triangular prism, used as the basic geometrical unit, gives two sets of plane trusses, which meet at an angle (here 90 deg.)

The cube (or rectangular prism) also gives two sets of plane trusses. Note that diag-

nals are not generally provided in plan; thus, for rigidity, at least two complete edges of the floor system must be triangulated as shown. Floor or roof decking might be used to achieve this rigidity.

The hexagonal prism gives an upper and a lower plane of hexagons, connected vertically at each corner and diagonally from each upper corner to the diametrically opposite lower corner. Note the joint where the diagonals intersect. Three hexagonal prisms are needed for rigidity.

Octahedra plus tetrahedra give what may well be called isometric space frames. These lattices, which can be generated by the regular rhombohedron (itself made up of one octahedron and two tetrahedra) permit all members to be the same length. They correspond to the crystallographer's "face-centered cubic."

(See Fig. 3).

If an isometric space lattice is cut by any plane containing the faces of the octahedra (and the tetrahedra), the result is a type T isometric space frame (so-called because of its triangular pattern on the plan.)

If, on the other hand, the lattice is cut by any plane containing the central squares of the octahedra, the result is a type S isometric space frame (because of the squares that appear on the plan.) This truss has the advantage of conforming easily to the plan of rectangular buildings. (It has been used, for example, in two experimental structures erected for Unistrut Corp.)

Note that the formula for the number of members is not satisfied unless there are at least six squares in the upper plane and two in the lower.

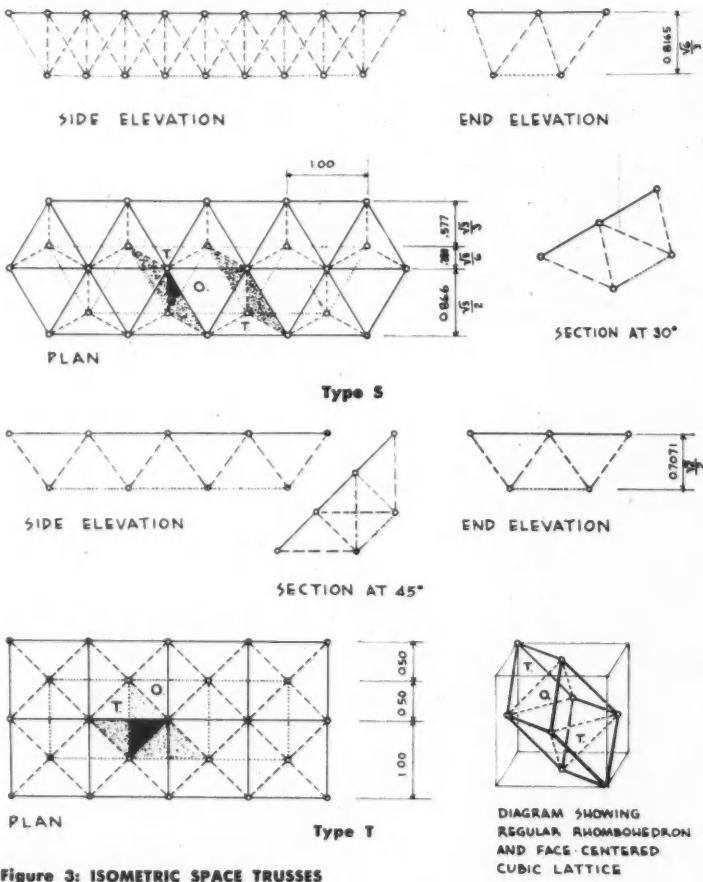
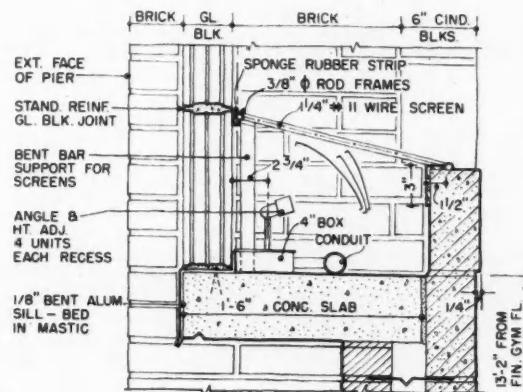
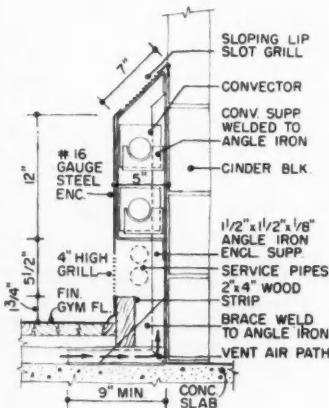


Figure 3: ISOMETRIC SPACE TRUSSES



## Two Details Cut Mechanical and Electrical Costs in Gyms

1. Arrangement for concealing heating piping eliminates trenching
  2. Lighting system conveniently hides conduit

Searching for economies that might be applied to mechanical systems of a school addition recently, the office of George B. Post & Sons, New York, hit upon a means of eliminating long runs of expensive pipe trench. Lessing Williams of this firm, tells how the wall space beneath conectors in a slab-on-ground gymnasium was used as a chase to conceal utility piping which otherwise would have required many hundreds of dollars worth of trenching.

The detail which sparked the idea showed a standard convector in cross section against an outside wall (Fig. 1). It was known that, to withstand the impact of gym activity, a heavier than standard sheet metal cover would be needed for convectors. It became a simple matter, then, to increase the height of the cover to provide space for pipes mounted on the wall. The cover was extended to the floor, with slotted grille near the bottom and on the sloping top.

There were advantages to this treatment in addition to the saving of trenching costs. Air circulation through convectors was increased by stack effect of the deeper front. Ac-

cess to pipes and valves was simplified. Appearance of the convector wall was improved. And the enclosed pipe chase allowed the venting of sub-floor sleeper spaces into this same channel to take advantage of stack effect and assure better ventilation between concrete slab and gym floor.

A variant of the same idea has been incorporated into Post plans for another building which was to have a run of piping through second floor joists near an outside wall. By mounting pipes, instead, in a furred chase enclosing also the convectors under second floor windows, appearance of the wall and accessibility of the piping were improved while joist strength was left unimpaired by costly boring for pipes.

### **Simplified Conduit Installation**

At the East Woods School in Oyster Bay, N. Y., the Post firm, by a simple architectural device, solved a gymnasium lighting problem and at the same time saved a great deal of fixture and conduit installation expense.

The gymnasium was designed with brick facing on concrete block.

walls recessed between engaged columns on 10-ft centers. At clerestory height, precast reinforced concrete cross-members provided a soffit between columns and a sill supporting glass block panels to roof height flush with outside facia of sills (see photo). Indirect lighting, recessed at sill height, was to be reflected from the ceiling as a means for avoiding glare.

The problems of selecting lighting fixtures and attaching conduit to interior block walls, at the same time coping with the vulnerability of electrical components to gymnasium activities, were solved by simply continuing the block wall in 4-in. thickness one course higher than the sill (Fig. 2) as both light shield and protection. Conduit was then easily laid into the open channel thus formed between glass and concrete blocks. Sleeves were cast in for passage through columns. Swivel spot fixtures were installed at intervals in the channel and directed at the ceiling. Fixture and installation costs were much below normal, and a complete, protected, easily accessible system was provided.

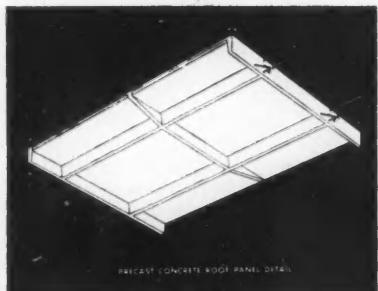
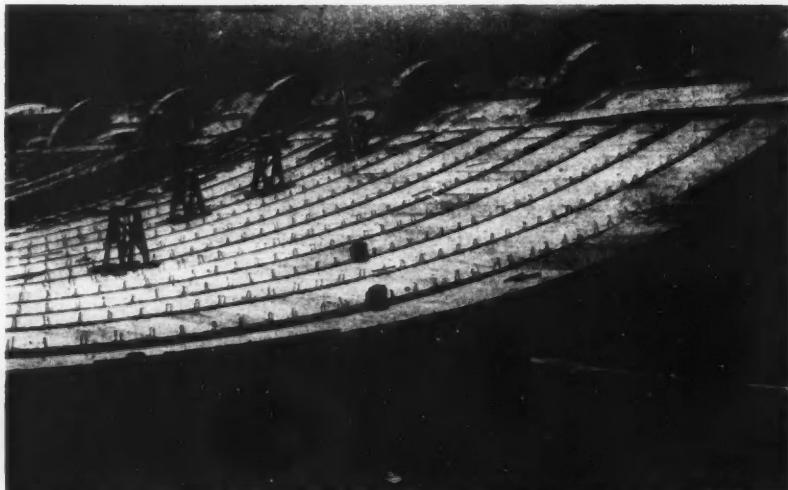
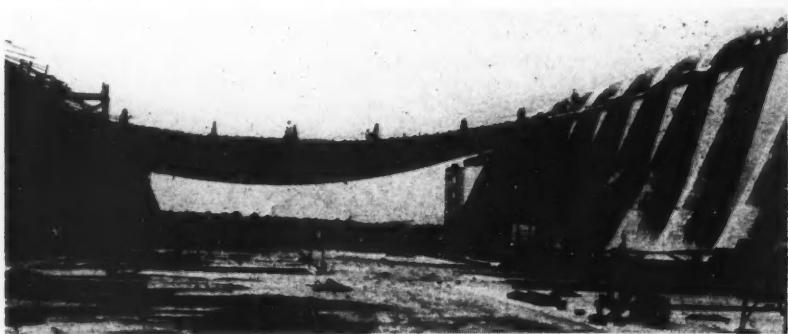
## HAMMOCK-TYPE ROOF FOR DULLES AIRPORT

Construction is well advanced on the structure for the new Dulles International Airport west of Washington, D.C. by the office of Eero Saarinen.

All interior columns have been eliminated by a hanging roof which is carried on 1-in. diameter catenary cables spanning 150 ft. The cables are fastened to an edge beam, which is poured in place between adjoining columns.

The roof decking, 89,800 sq ft in total area, will be made up of 1792 precast concrete panels. Poured concrete beams will go around the cables and between the panels.

The 1-in. slab between beams has 1½ in. of foamed polystyrene insulation cast to the underside.



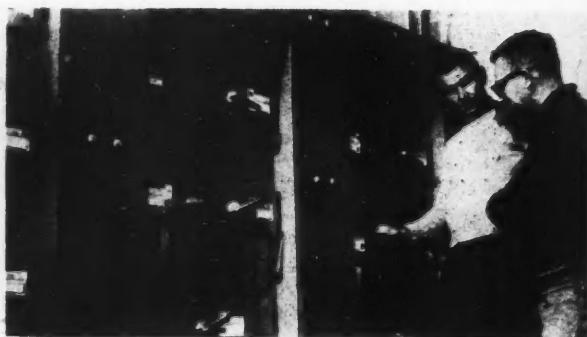
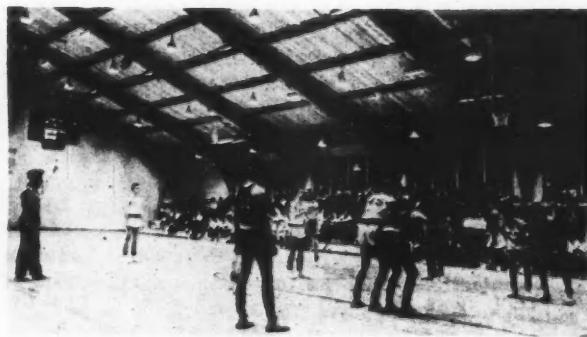
## QUARTZ LAMPS HEAT AND LIGHT A GYMNASIUM

Fifty electric infrared fixtures in a new gymnasium for Greenville College, Greenville, Illinois, supply heat as well as 150 footcandles of light on the playing floor. Tubular quartz infrared lamps are used which convert about 87 per cent of their input wattage into radiant heat.

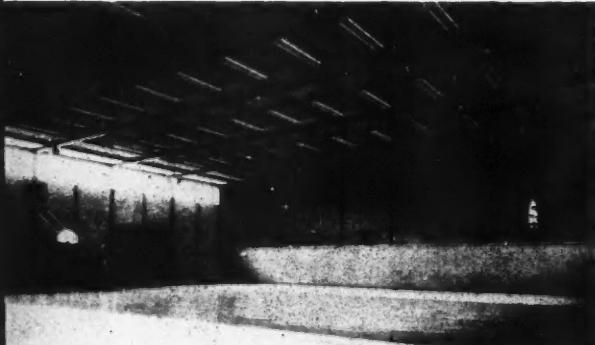
Each row of fixtures contains one type which has a reflector specifically designed to direct or spread infrared heat over a particular area or zone of the floor below. This allows the concentration of more heat on spectator seating, for instance, than on the playing area of the floor where

less heat is needed. The fixtures are also specially designed to reduce glare in the range of vision to a comfortable level.

Operating costs for the entire 1960-61 winter heating season were reported to be less than \$2000. The photo shows the switch gear for lamps.



# 40% LESS DEAD LOAD with TECTUM ROOF DECKS



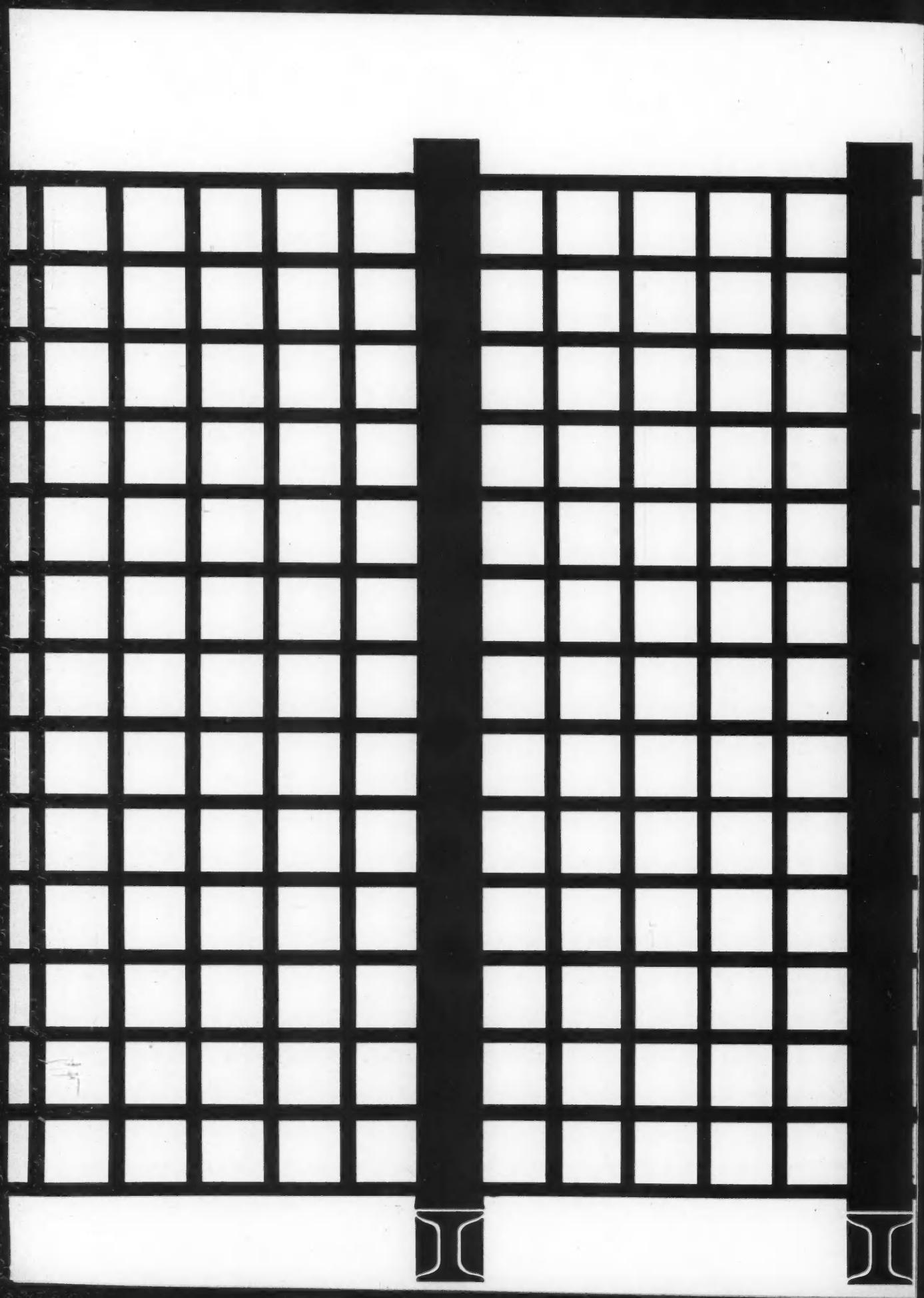
The new Savannah, Georgia Armory, illustrated, is an excellent example of utilizing Tectum's lighter weight to improve safety factors. The armory, built on an unfavorable soil condition, makes use of a rigid steel frame, concrete block walls and Tectum roof deck. The frame carries the weight. Walls act only as screens. Architects: Thomas, Driscoll, Hutton, Savannah, Ga. General Contractor: Hugh Jackson, Savannah, Ga.

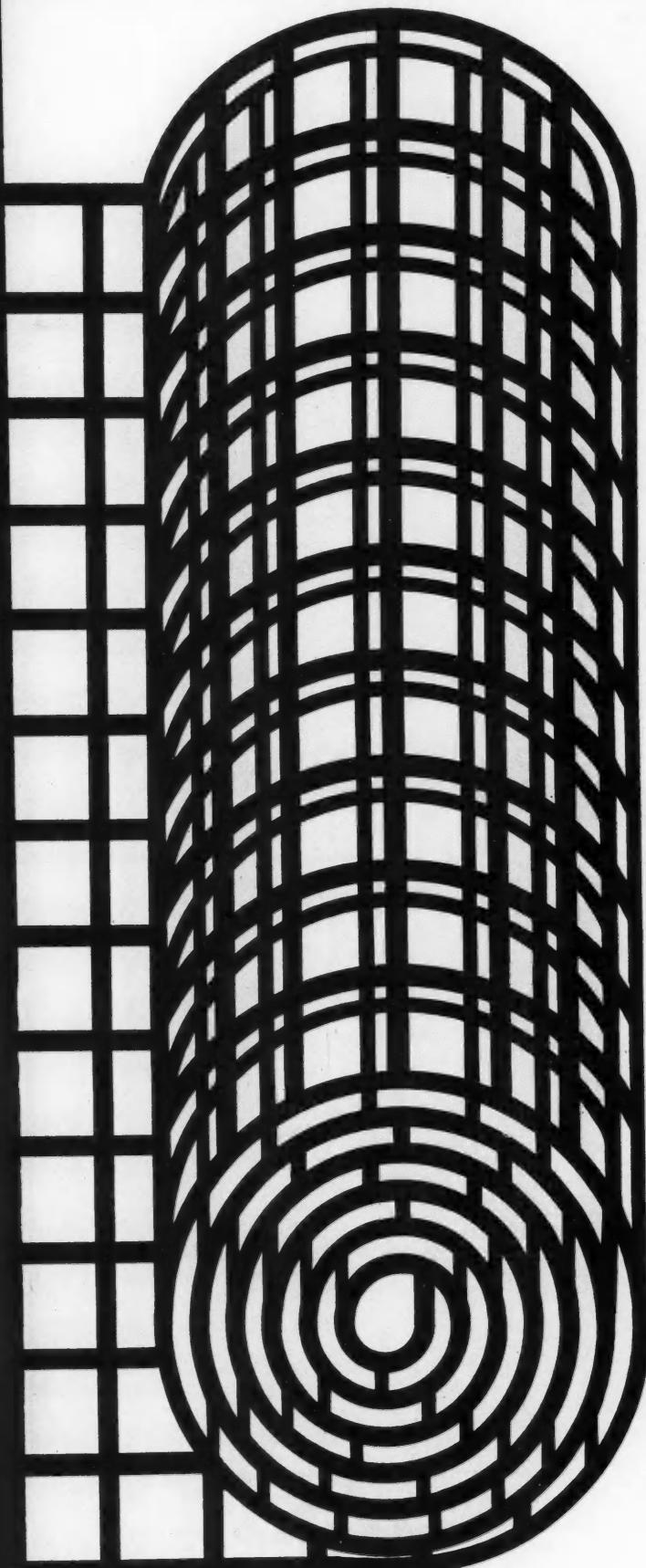


If you are considering an insulating-acoustical wood fiber roof deck, did you know that Tectum saves at least 40% of the total roof deck weight? On a building of 100,000 square feet this is the equivalent of nearly 200 tons reduction in dead load on framing, load bearing walls and foundation. Translate this into possible steel savings, shipping and erection costs or improved safety factors and you'll appreciate how much Tectum contributes toward building economies.

An independent research laboratory recently tested Tectum and two other similar wood fiber roof deck materials for an architect client. Tectum's sample weighed 5.4 psf; Type A, 9.2 psf; Type B, 9.8 psf. Tectum is the only structural wood fiber board that does not use Portland cement as a binder. Thus the weight advantage — as well as several other features you'll want to consider. For complete information see your Tectum representative or write Tectum Corporation, 535 East Broad Street, Columbus 15, Ohio.

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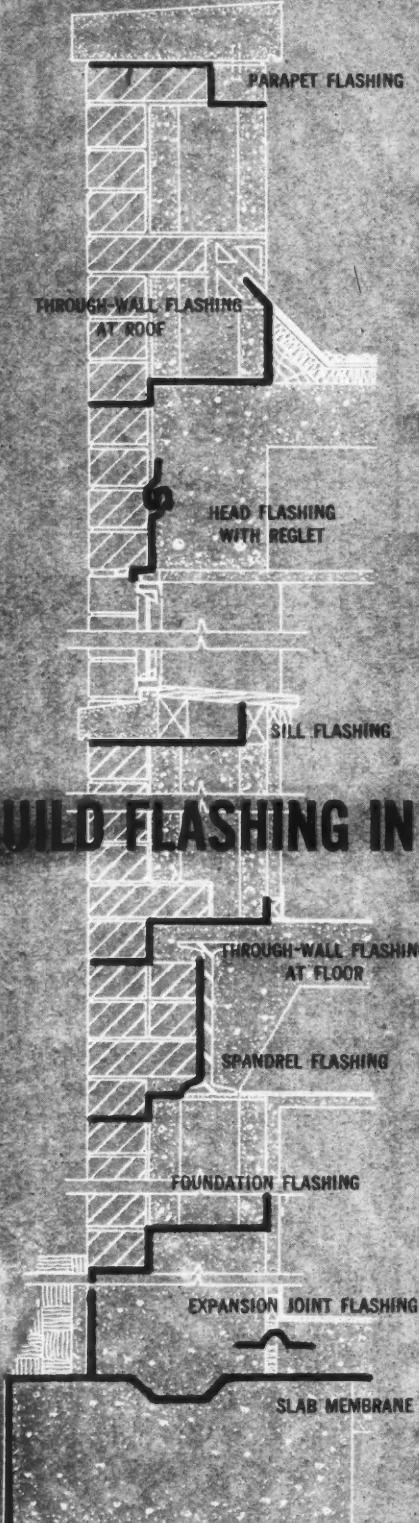
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# Building Components

## Application and Specification of Materials and Equipment

### A Lexicon for PLASTICS IN BUILDING

#### Part II (Conclusion)

When the properties of plastics are compared with conventional materials, it is apparent that along with the similarities are numerous differences. It is important, therefore, that the physical and chemical properties of plastics be kept in mind by the designer. Such characteristics as thermal coefficients, weather resistance, corrosion resistance, fire behavior and deformation under load must be appraised in selecting plastics for building components.

#### Water & Vapor Barriers

##### MEMBRANES, FLASHING, TAPES

Plastics typically employed—Polyethylene; PVC; Saran.

Preferred because—Flexible; sealable, thus offering waterproof sheeting of any size. Sufficient elasticity can be formulated to accommodate building's movements, also to seal around penetrating nails, pipes, etc.

Remarks—Plastic foams employed as thermal insulation often double as vapor barriers; so can plastic films applied to sheets such as plywood. With flashing and tapes, it must be kept in mind that some plastics are formulated only for placement within the construction, not for exposure to ultra-violet and weather.

##### WEATHERSTRIPPING, WATERSTOPS

Plastics typically employed—PVC; polyurethane.

Preferred because—Can be formulated for elasticity approaching that of synthetic rubbers, which are also common in these applications. No corrosion; no staining. Thermoplastics, such as PVC, readily joined at mitered corners by "welding," or thermal-pressure-joinery.

Remarks—Such flexible materials, in extruded form, offer ideal waterstop-expansion-joint between adjacent pours of concrete slab or wall. Another class of synthetics somewhat related to plastics are also important in building as water-barriers: "elastomers" (i.e. rubbery materials) such as neoprene gaskets and sheeting, polysulfide and butadiene sealants, silicone polymers, synthetic-rubber roof coatings, and the like.

#### Thermal Insulation

Plastics typically employed—Polystyrene, polyurethane (foams).

Preferred because—Insulating prop-

erties not reduced by wetting; density readily controlled; special properties possible: adhesiveness, vapor barrier, some structural strength, decorative translucence. Remarks—Where desirable to fill voids, may be foamed-in-place. Although these foams burn when held in a flame, they usually are self-extinguishing.

#### Structural Elements

Plastics typically employed—Polyester or epoxy, reinforced with glass fibers; rigid PVC.

Preferred because—Make possible high strength-to-weight ratios.

Remarks—Plastics have been used in sandwich panels for faces, adhesives and cores. Phenolic impregnated kraft honeycomb is probably the most used core material. More recently polystyrene and polyurethane foams have come into use. So far plastics have been little used structurally for load-bearing panels sandwich.

#### Finish Hardware

Plastics typically employed—Almost all the thermoplastics listed here and most of the thermosets.

Preferred because—Good decorative characteristics; minimal maintenance; inexpensive even when intricately shaped. Certain properties often determine specific applications; for instance, nylon's superb wear-resistance has introduced it into door hardware.

Remarks—Plastic or plastic-coated insect screening popular because non-corroding. Plastic drawers now as commonplace as plastic chairs. Plastics safer than glass or ceramic for knobs and handles, towel bars, etc.

#### Electrical Components

Plastics typically employed—All.

Preferred because—Superior electrical properties, especially under

by William Demarest  
Director, Plastics in Building  
Manufacturing Chemists' Association, Inc.

adverse conditions such as prolonged dampness, vibration, etc. Translucency the basis for widespread use as electric-light diffusers, including "luminous ceilings." Remarks—First major commercial area for plastics (in the 1920's) was electrical applications; this continues to broaden with the increase of electrical and electronic complexity in buildings.

#### Plumbing

Plastics typically employed—For fixtures and fittings, reinforced polyester, rigid PVC, ABS; for piping, polyethylene, PVC, and various butadiene blends akin to ABS.

Preferred because—No corrosion. Easy to handle, to assemble. Fewer joints; easy maintenance.

Remarks—At present only higher-priced plastic pipes will handle hot liquids under pressure; therefore plastic pipe is generally limited to industrial uses. But lower-priced plastics to do this are just around the corner and may revolutionize residential plumbing.

#### Miscellaneous Construction Aids

Translucent polyethylene film provides an ideal temporary enclosure for wintertime construction. The same material is widely used as an inexpensive tarpaulin to protect equipment or materials stored on site. A top-quality, very durable tarpaulin is PVC-coated nylon fabric. Plastic chairs to support reinforcing rods in concrete make good use of the non-corrosive properties of plastics. Various plastic coatings for concrete forms produce smoother concrete, prolong the life of the forms, and make their removal easier. Strippable plastic coatings are used to protect plumbing fixtures and finished metal surfaces during construction.

The synthetic resins upon which most paints are based today are closely identified with the plastics discussed here; so, too, are a number of adhesives and binders that are important in building: phenolic adhesives for exterior-grade plywood, phenolic binders for glass-fiber insulating batts and boards, urea particle-board binders, resorcinol or epoxy adhesives, and similar materials.

## DESIGNING FOR PLASTICS

### Thermal Coefficient

Thermal expansion and contraction of plastics is typically high; the coefficient is five or more times that of metals. This calls for special care in detailing, keeping in mind movement in the major axis or plane of the component. Thus means should be devised for avoiding or disguising distortion of large sheets. In the same general connection, an important advantage of plastics for use in building is their capability of being formed fairly readily to resist stress concentrations, whether arising from thermal movement or other causes.

### Durability

Weathering of plastics outdoors and the general durability of plastics when not exposed to the weather, are questions uppermost in the minds of designers and specifiers. Unfortunately, the plastics industry has not yet succeeded in developing accelerated laboratory tests that reliably predict the weathering performance of materials over periods of 20 years and more.

The record of actual exposures, of course, grows longer and more complete all the while. There are acrylics that have stood up well under outdoor exposures exceeding 20 years. A few other plastics can point to exterior installations 15 years or more old, with negligible deterioration. With new formulations constantly appearing, the designer can only cautiously weigh the variables. The more easily replaceable components—glazing, for example—might not have to prove themselves by decades of actual exposure-history if replacement costs were counterbalanced by other factors: low initial installed cost, good appearance, resistance to damage, ease of maintenance.

Aside from weather-erosion and deterioration under ultra-violet light, the general durability of plastics in typical building applications has been very good. PVC for example provides perhaps the best resilient flooring from the viewpoint of standing up under neglect. According to accelerated tests, nylon outwears bronze mechanically. Many plastics offer impact resistance that makes them more durable than alternative materials for the same application. (The success of plastic and plastic-coated luggage illustrates this.) Sometimes the properties which provide durability in plastics also enhance their attributes for safety. For example, the use of plastics in shower doors and room dividers is appropriate since it is almost impossible to fall through them. Even if broken they are a negligible hazard.

### Corrosion, Stain Resistance

Another aspect of plastics' durability which can be all-important to the designer is that they are not subject to chemical corrosion or to electrolytic action. This generalization must be modified, however, by pointing out that some plastic materials are selectively attacked by certain classes of solvents—mostly chemicals that are not likely to be found outside laboratory or industrial buildings. (Where a plastic is to be put to a new use, the designer would be wise to check the possibilities against a listing of the degree to which a number of chemicals will attack it. Such tabulations are available from the producer of the basic material.) This absence of ordinary corrosion means absence of staining as well as increased durability.

### Fire Behavior

Being organic materials, all plastics can be destroyed by fire. Although some plastics burn of themselves, many are self-extinguishing when the flame igniting them has been removed. Among these flammable plastics, there is a great range of the degree of ease of ignition. Another organic material, wood, perhaps exemplifies the average burning characteristics of plastics and is easily kept in mind by the designer. Where actual fire hazards may be present, specific properties of the material must be considered. Ther-

moplastics, for instance, will soften—perhaps melt—before a fire even reaches them. Partly depending on the softening temperature, this may be bad or good: Underwriters' Laboratories approves those plastics for ceiling light-diffusion that can be relied upon in case of fire to fall out of position soon enough so as not to interfere with effectiveness of sprinklers placed above the suspended ceiling.

Most building codes do not take ease of ignition into account, but the designer should do so wherever he believes that this could bear on fire safety. Codes do emphasize two characteristics of materials, both of which presuppose an out-of-control blaze already going: One is fire retardation, and this is something only for heavy constructions of brick, concrete, etc.—not for organic materials. The other is the rate at which flame may spread across the surface of a flammable material. Especially in spaces used by the public, this can become a fire- and panic-hazard and should be kept in mind, building code or no. According to the various standard tests used for measuring this characteristic, the flammable plastics present a wide range of surface-flame-travel. Some will hardly spread flame at all; others will do so faster than woods.

### Deformation Under Load

"Creep" is a property of most materials, but, with traditional materials of construction, it is reasonable to assume elastic behavior within certain limits of stress. However, many plastics, especially the thermoplastics, exhibit time-dependent plastic behavior: flow, or creep, of the material under load, so deformation depends not only on the load, but also on the rate at which it is applied and on its duration. Further, this phenomenon is greater at elevated temperatures. In the case of many plastics, these relationships are of major significance and must be taken into account; otherwise, failures may occur. Appropriate stress levels and factors of safety must be employed. For materials exhibiting no sharply defined yield points or elastic limits, the working stresses are likely to depend upon the degree of creep that can be tolerated.

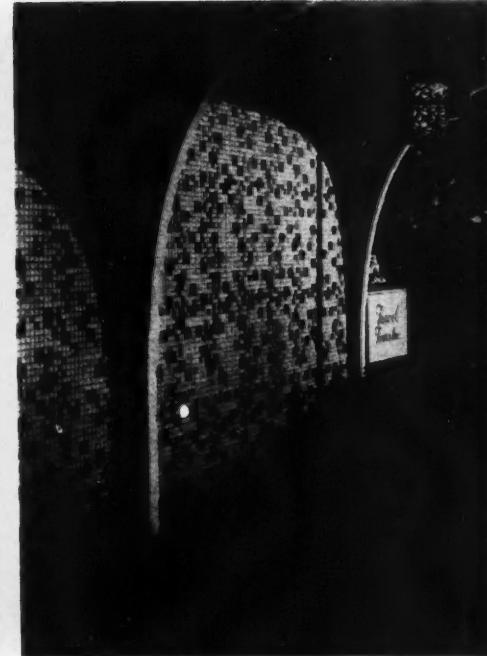
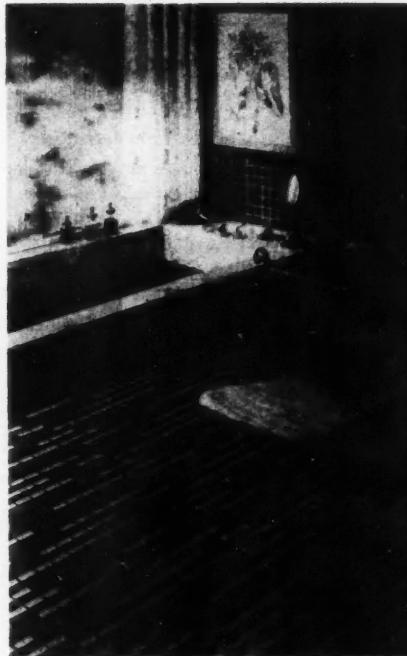
## MOSAIC TILE LINE OFFERS DESIGN, COLOR, VARIETY

The *Precedent Collection* of ceramic mosaic tiles incorporates a new tile body, new sizes, colors and patterns.

The tile body is denser and finer grained than previous ones, resulting in a tile body more resistant to stains and easier to clean. The tiles are made in three modular sizes: 1 by 1 in., 2 by 1 in., and 2 by 2 in.—making possible a wide variety of patterns, including custom designs.

There are 54 colors to choose from, 28 *Clearline* colors—bright and pastel hues, 14 *Texline*—colors softened by the addition of white flecks and 12 glazed accent colors. The colors were developed to harmonize with each other and to co-ordinate with standard glazed tile colors.

Fifty-three patterns are being featured, divided into seven groups—designer patterns, *Texline* blends, 1 by 1 in. blends, stripes, 2 by 2 in. blends, 2 by 1 in. blends and block random patterns. *American Olean Tile Co., Lansdale, Penn.*



## AREA LIGHTING FIXTURES INTRODUCED

New area lighting fixtures to serve a variety of needs have been introduced by the General Electric Co.

A compact floodlight (center, below) for high-intensity area lighting utilizes the *Quartzline* lamp, which produces 20 per cent more light and has twice the lamp life of conventional filament sources. The units, about the size of small television sets, are available in 500 and 1500 watts. They are designed for large areas where their wide horizontal beam and narrow vertical beam with sharp

cutoff make fewer poles necessary.

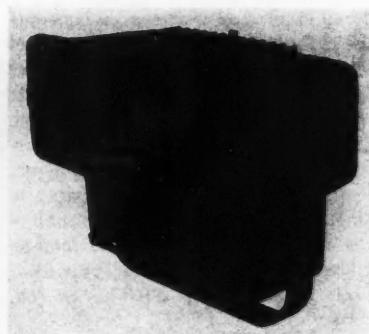
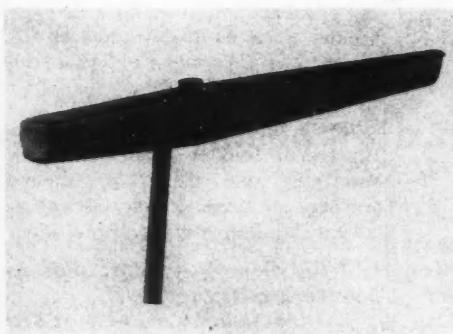
An internal-ballast mercury flood-light (right, below) is designed for high efficiency and long life. A wrap-around reflector provides a wide angle beam for uniform coverage of wide rectangular areas.

Where appearance is a primary consideration, a fluorescent post-mounted lamp (left, below) offers a broad distribution pattern of soft, glare-free light. The fixture uses a single four-foot *Power-Groove* lamp, which produces 6,900 lumens of light

from 150 watts. It is mounted from 10 to 20 ft above the ground.

Two other post-mounted fixtures are designed for areas such as walkways where low mounting heights (10 to 20 ft) and decorative appearance are important. One unit is designed for both mercury-vapor or incandescent lamps. It is available in a variety of light distribution patterns. The other unit is similar, but uses only incandescent lamps. *General Electric, Hendersonville, N.C.*

more products on page 208



## Office Literature

### Industrial Gas Heaters

Industrial applications of direct fired gas heaters are discussed in an eight-page heating handbook, second in a series of handbooks discussing direct-fired gas heating equipment. *Reznor Mfg. Co., Mercer, Penn.*\*

### Calcium Chloride in Concreting

Three new booklets are now available to concrete users. *Year Round Concreting*, (A.I.A. 3-B-2) summarizes the American Concrete Institute's recommendations for cold weather concreting. *Calcium Chloride for Concrete Construction* is designed for engineers who wish to accelerate the set of concrete, especially at temperatures below 70° F. *Calcium Chloride in Concrete* is a 40-page technical manual with data on major effects of calcium chloride, strength, cold weather protection and air entrained concrete. *Calcium Chloride Institute, 909 Ring Bldg., Washington 6, D.C.*

### Fluorescent Lamps

A line of commercial recessed fluorescent luminaires—the *Mark II Mainliner*—is described in a 10-page booklet, No. B-8235, *Westinghouse Lighting Division, Edgewater Park, Cleveland, Ohio*\*

### Door Selection Sheet

A single reference sheet simplifies selection of the proper frames and doors for particular uses. *The Steelcraft Manufacturing Co., 9017 Blue Ash Rd., Cincinnati 42, Ohio*\*

### Steel Pipe

The varied uses of steel pipe in buildings, design, etc., and specifications for the different kinds of pipe needed are told in a 30-page booklet. *Wheeling Steel Corp., Wheeling, W. Va.*

### Fiber Pipe and Conduits

Applications of bituminized fiber pipe, conduits and fittings are given in two booklets, a 12-page "Fibre Pipe Catalog" and an eight-page "Electrical Conduit Catalog." *Bericom Div., Brown Co., Berlin, N.H.*\*

### Air Handling Troffer

Illustrated manual describes *Triple-Shell Lumi-Flo* air handling troffer, showing how it provides lighting, heating, ventilating and air conditioning from the same concealed ceiling unit. Installation and engineering data included. Bulletin B. *Benjamin Division, Thomas Industries Inc., 207 E. Broadway, Louisville, Ky.*\*

### Masonry Wall Construction

Five reports summarize studies of masonry wall construction. Three deal with masonry wall reinforcing in stacked bond, glass block and cavity forms. The others consider shear strength of two types of masonry wall control joint materials. *Duro-O-wal, Cedar Rapids, Iowa*.\*

### Lighting Style Book

A 96-page lighting fixture catalog features more than 450 styles, many appropriate for stores, offices, etc. as well as houses. *Lightolier, Jersey City, N.J.*\*

### Multizone Air Conditioning

Detailed technical information about multizone air conditioning units is included in a 64-page handbook which describes 24 different units. Bulletin 34, *Marlo Coil Co., 7100 S. Grand Ave., St. Louis 11, Mo.*\*

### Plumbing Layout Sheets

Over 20 different institutional plumbing layout sheets, showing details of piping and connections in different plumbing installations have been compiled from drawings of actual institutional installations. *Aluminum Plumbing Fixture Corp., 778 Burlway Rd., Burlingame, Calif.*

### Outdoor Lighting

A series of four bulletins describes transformers for outdoor incandescent and outdoor mercury-vapor lighting, giving details on lights from 100 to 1000 watts. *Jefferson Electric Co., Bellwood, Ill.*

### Dual-Duct Air Distributors

Catalog No. 1361 has 12 pages on low-velocity dual-duct acoustic terminal control (ATC) units, for use in multizone or reheat systems. *Carnes Corp., Verona, Wisc.*

### Prestressed Concrete

Data on prestressed concrete, with emphasis on the steel strand tensioning elements are given in a 20-page booklet. *John A. Roebling's Sons Division, The Colorado Fuel and Iron Corp., Trenton 2, N.J.*\*

### Drapery Equipment

Illustrated booklet gives details on specifying and installing drapery traverse systems. *Young Manufacturing Co., Box 952, Cheyenne, Wyo.*

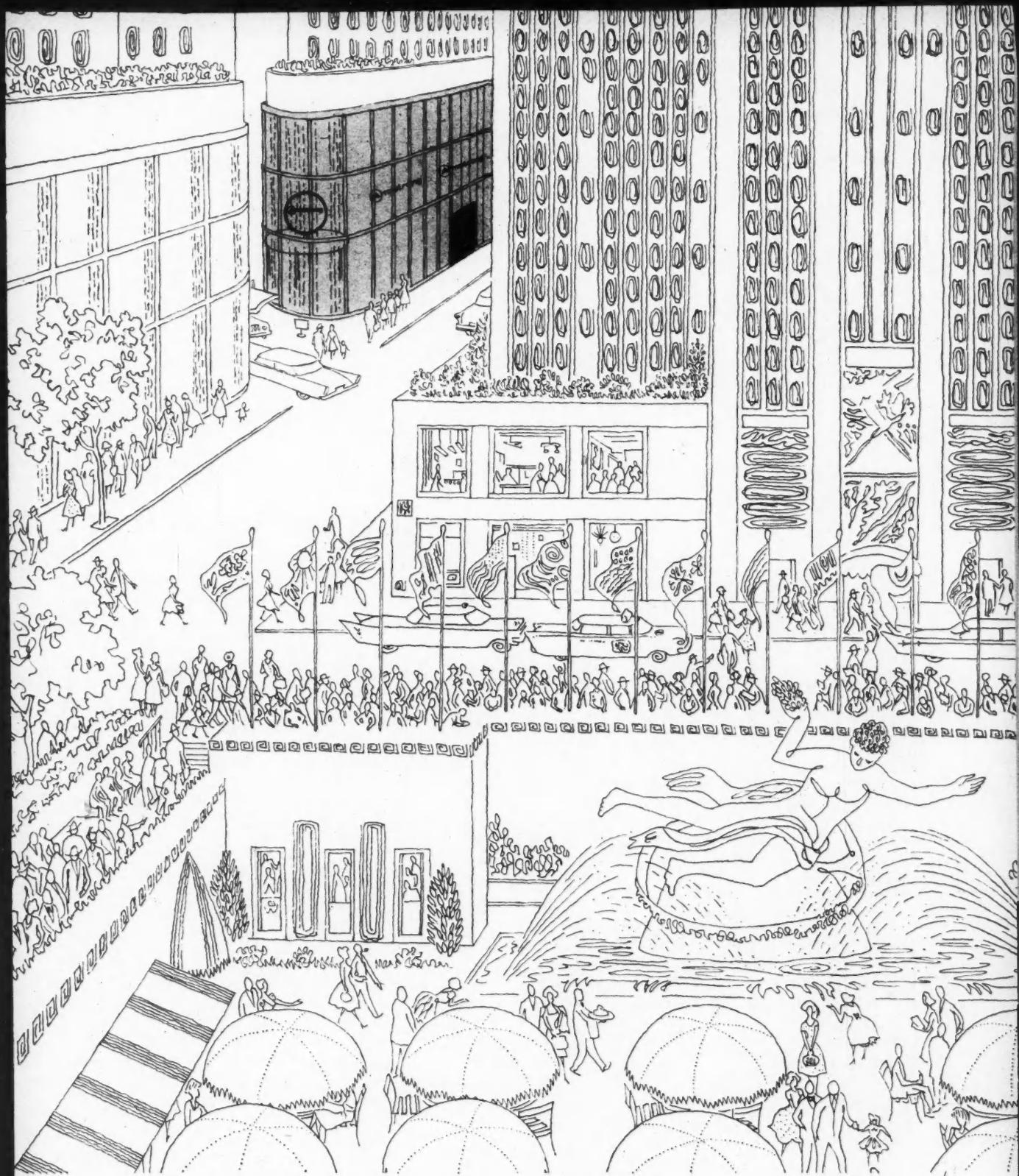
\*Additional product information in Sweet's Architectural File

more literature on page 244



### Structural Steel

Significant developments in constructional steels and new design concepts are summarized in a 28-page booklet which gives technical data and ideas to guide people who design, fabricate and build with structural steels. Among the subjects treated are carbon and low-alloy steels, wide-flange beam sections and ideas for composite construction with dissimilar materials. *Market Development Division, Room 2809, U. S. Steel Corp., 525 William Penn Place, Pittsburgh 30, Penn.*\*



**THE NEW ARMSTRONG PRODUCT CENTER IS IN THE HEART OF NEW YORK (60 West 49th Street, Rockefeller Center)** Armstrong Architect-Builder Consultants and acoustical experts are on hand to give you technical information and suggest new design and functional possibilities for the newest developments in acoustical ceilings, resilient floors, and vinyl wall coverings. Our color consultants and decorators are also available to give you detailed information on interior planning. Open 9-5, Mon.-Fri. For an appointment, call JU 2-3700.

**Armstrong FLOORS and CEILINGS**

## Product Reports

continued from page 205

### Vapor Barrier

*Pyro-Kure* is a pipe insulation with permanent self-extinguishing properties when exposed to fire. The special adhesive binding the aluminum foil, glass fiber and 35 lb kraft emits a gas which smothers the flame when surrounding temperatures reach combustion level. The manufacturer reports the following performance ratings: vapor transmission—less than 0.01, U/L flame spread—5 on the foil side and 25 on the kraft side.



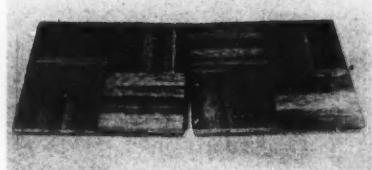
Thickness of fiber glass insulation ranges from  $\frac{3}{4}$  in. to  $1\frac{1}{2}$  in. depending on pipe size. Two layers of foil are used in the barrier to protect insulation. *American Sisalkraft Div., St. Regis Paper Co., 2403 S. Burdick St., Kalamazoo 34, Mich.*

### Specialty Glass

Three specialized types of glass are now available from Amerada Glass. *Comfor-Lite* contains a louvered sun screen, available in several finishes, hermetically sealed between two panes of glass. *Acousta-Pane* is a laminated safety glass which offers good visibility while absorbing sound, especially in the 1000 to 4000 cycles per second frequency range. It is available in clear, opaque, and gray or blue tint. Both heat and light transmission are reduced by laminated *Twi-Lite* glass, thus lowering air conditioning requirements. It is guaranteed against fading and is sound and shatter resistant. *Amerada Glass Corp., 3301 S. Prairie Ave., Chicago 16, Ill.*

### Parquet Floor Panels

Six-inch-square hardwood tiles, in parquet design, are laminated to *Homasote* backing made in 2 by 1 ft and 1 by 1 ft panels. Along with ease of installation because of the larger units, the *Homasote* base provides a resilient walking surface and insulation. Individual *Flexstrip* tiles are made up of seven strips of Appalachian hardwoods locked together by a soft wire for built-in expansion. The



surfaces are pre-finished. *Homasote Co., Trenton 3, N. J.*

more products on page 218

## CONSTRUCTION DETAILS

For LCN Closer Concealed-in-Door Shown on Opposite Page

*The LCN Series 3002-3003 Closer's Main Points:*

1. Arm is attached to door frame by surface-applied shoe; closing power adjustable by reversing position of shoe
2. Door is hung on butts; closer is easy to adjust
3. Closer is used for interior doors only; Underwriters approved for self-closing doors
4. Hydraulic back-check protects walls, etc. on opening swing
5. Double arm provides high closing power
6. Arm may be regular, 90-140° hold-open or fusible link

*Complete Catalog on Request—No Obligation  
or See Sweet's 1961, Sec. 18e/Lc*

### LCN CLOSERS, PRINCETON, ILLINOIS

A DIVISION OF SCHLAGE LOCK COMPANY

Canada: LCN Closers of Canada, Ltd., P.O. Box 100, Port Credit, Ontario

# Modern Door Control by *LCN* Closer Concealed in Door

OFFICE OF INTERNATIONAL SHIPPING CO., INC.  
NORTON BUILDING, SEATTLE, WASHINGTON

LCN CLOSERS, PRINCETON, ILLINOIS

A DIVISION OF SCHLAGE LOCK COMPANY

Installation Details on Opposite Page

Bindon & Wright, Architects  
Skidmore, Owings & Merrill,  
Consulting Architects



PACIFIC COAST FAR EAST  
INC. PACIFIC COAST FAR EAST  
INC.

ANGLO CANADIAN SHIP  
PITTEISHI STEAM  
NORTH

# Toronto's new airport in the round



This is the way Toronto International Airport will look with all four aeroquays in operation. The second floor is the main level of the aeroquay. It contains the ticket lobby, shops, lounge, coffee shop, and departure areas, as well as observation decks. John B. Parkin Associates, Consulting Architects and Engineers to the Department of Transport, H. J. Connolly, Director of Construction Branch, W. A. Ramsay, Chief Architect. General Contractor: Foundation Company of Canada, Ltd.

*As adaptable as the steel that frames it, Toronto International Airport is designed to grow as jet traffic grows*

Toronto's new terminal calls for a central administration building surrounded by four aeroquays. These aeroquays will house all the passenger facilities and operations of the domestic and foreign airlines flying in and out of Toronto.

Shaped like a doughnut, each steel-framed aeroquay will be two buildings in one, 660 feet in diameter. A roadway system will lead vehicles, by underpasses under the aircraft apron, directly to these airline buildings.

The first aeroquay is scheduled for completion in 1962. Sites for three others are available, and these aeroquays will be built as needed.

#### *All-welded steel framework*

All connections in the shop were welded. For just the 6,000 tons of column sections with welded cover plates, York Steel Construction welded some 40,000 lineal feet of steel. All rigid connection plates were field welded to the column sections at the site.

#### *Steelwork erected in dead of winter*

To maintain weld quality in frigid weather, York Steel Construction pre-heated and post-heated the steel, using mobile banks of oxygen and propane. All welds were ultrasonically tested at the site; no failures were reported. Although the winter was severe, only 3½ weeks of erection time were lost to the bad weather.

#### *15,000 tons in under 180 days*

York Steel fabricated and erected some 15,000 tons of shapes and plates for aeroquay No. 1. All steel went up in under 180 days. Bethlehem supplied 9,803 tons of wide flange, and 196 tons of plates. The balance of the tonnage was obtained from Canadian sources.



for Strength  
... Economy  
... Versatility



Steel framework of aeroquay No. 1. Steel Fabricator and Erector: York Steel Construction, Ltd.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. Export Sales: Bethlehem Steel Export Corporation

# BETHLEHEM STEEL



# This unit ventilator brings air conditioning within reach of almost any school budget!

Schools in every section of the U.S.—more than 700 of them—are now equipped with Herman Nelson HerNel-Cool™ "now or later" surround air conditioning systems.

Construction costs for these systems start all the way from \$8.00 per sq. ft. to

For the most part, construction costs are **as high or higher** than equipment for Herman Nelson systems. And that's the page many schools are saving on air conditioning.

Unit ventilator. Classic  
surround air conditioning.

Herman Nelson photo-reporter 7/64

SECOND IN A SERIES:

## "We hope to air condition

*Hanford Joint Union High School, Hanford,  
California. Superintendent of Schools,  
Stratton L. Tarvin. Architect: William Hasdrup,  
Fresno, California. Mechanical Contractor:  
Gillott Plumbing & Heating, Fresno, California.*



Stratton L. Tarvin (left), Superintendent of Schools, and Dr. R. deCampos, Chairman of the Hanford Board of Trustees, reflect community enthusiasm for air conditioned schools. They feel that air conditioning should be included in the plans for all future new schools in Hanford.

Mr. Tarvin says, "Air conditioning was considered in the early stages of planning. In our

climate, non-air conditioned rooms are unbearable about four months during every school year. Our year-round unit ventilator system eliminates these conditions.

"Our first experience with school air conditioning has been very successful . . . students are more alert and attentive, and teachers are less exhausted at the end of a day."

# "all future schools"

Stratton L. Tarvin  
Superintendent of Schools  
Hanford, California

## Architects utilize HerNel-Cool systems to reduce school construction costs

What is a community's reaction to its first air conditioned school? In Hanford, California, as in hundreds of other communities, school air conditioning has proved to be both practical and economical. In fact, school officials want air conditioning for *all* future schools.

Year-round HerNel-Cool Unit Ventilator systems allow the architect to design a more compact school. Low cost back-to-back classroom design makes it possible to eliminate design restrictions imposed by conventional schools. (Example: orientation for natural ventilation.) Expensive fenestration can also be eliminated.

Herman Nelson HerNel-Cool Unit Ventilators are flexible. They provide heating, ventilation and outdoor-air cooling during winter months, and keep room temperatures cool and refreshing in the summer. Air is filtered in each classroom unit . . . there are no dust-collecting ducts *between* the unit and the classroom. Write for more information: School Air Systems Division, American Air Filter Company, Inc., 215 Central Avenue, Louisville 8, Kentucky.

**Herman Nelson**   
SCHOOL AIR SYSTEMS DIVISION



*"Reaction of parents and community to our first air conditioned school has been highly favorable. It is a good example of the community's progressive education program. We're all very pleased with it," states the Hanford Joint Union High School P.T.A. President.*



*Effects of the Herman Nelson system are extremely important in the school's modern chemistry laboratory. Here a high degree of student activity, chemical odors, and other factors require the flexibility of a unit ventilator system to maintain comfortable, odor-free conditions.*



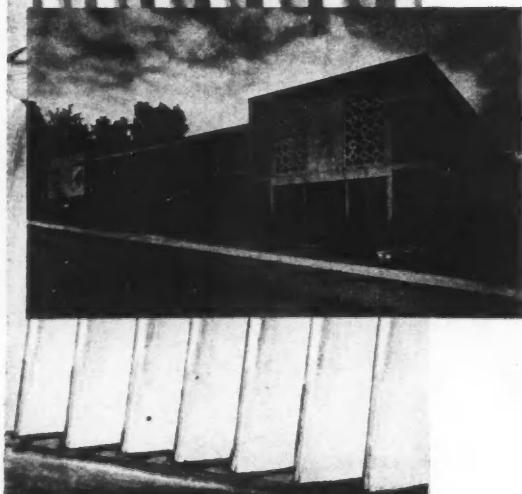


MERCY HOSPITAL, Des Moines, Iowa  
Architect: Brooks-Borg, Des Moines, Iowa  
Gen. Contractor: Wm. Knudson & Sons, Des Moines, Iowa  
Panels by Midwest Concrete Industries, Des Moines, Iowa



HENRY FORD HOSPITAL GARAGE, Detroit, Mich.  
Architect: Albert Kahn Associates, Inc., Detroit, Mich.  
Gen. Contractor: Darin & Armstrong Inc., Detroit, Mich.  
Sub Contractor: The Trucon Division of Devos & Reynolds, (pre-cast units), Detroit, Mich.

GREENEVILLE LIGHT & POWER BLDG., Greeneville, Tenn.  
Architect: Honeratt & Boyd, Greeneville, Tenn.  
Gen. Contractor: Hagan Bros., Greeneville, Tenn.  
Panels by Southern Cast Stone Co., Knoxville, Tenn.



# concrete panels

superb for expressing  
the unusual  
in design and color

best cast with **MEDUSA**  
**white portland**  
**cement**

Precast Concrete Paneling, load bearing or curtain type, is rapidly gaining favor as a means of expressing the unusual in wall design and color. Their design flexibility is unlimited since they are used with plain surfaces or with colorful exposed aggregate, white or tinted, sculptured or solar screened. Architects are specifying that these concrete panels be cast with Medusa, (the original) White Portland Cement with the diamond blue-white color, in order to gain dramatic appeal for exciting interiors and exteriors. For over a half century Medusa White Portland Cement has been winning the complete specification confidence of architects and builders. Write today for information including specifications.



**MEDUSA PORTLAND CEMENT COMPANY**

P. O. Box 5668 — Cleveland 1, Ohio  
Over 65 years of Concrete Progress

**lasting  
low-cost  
moisture  
barriers**

**"ELECTRO-SHEET"  
Copper-bonded  
products**

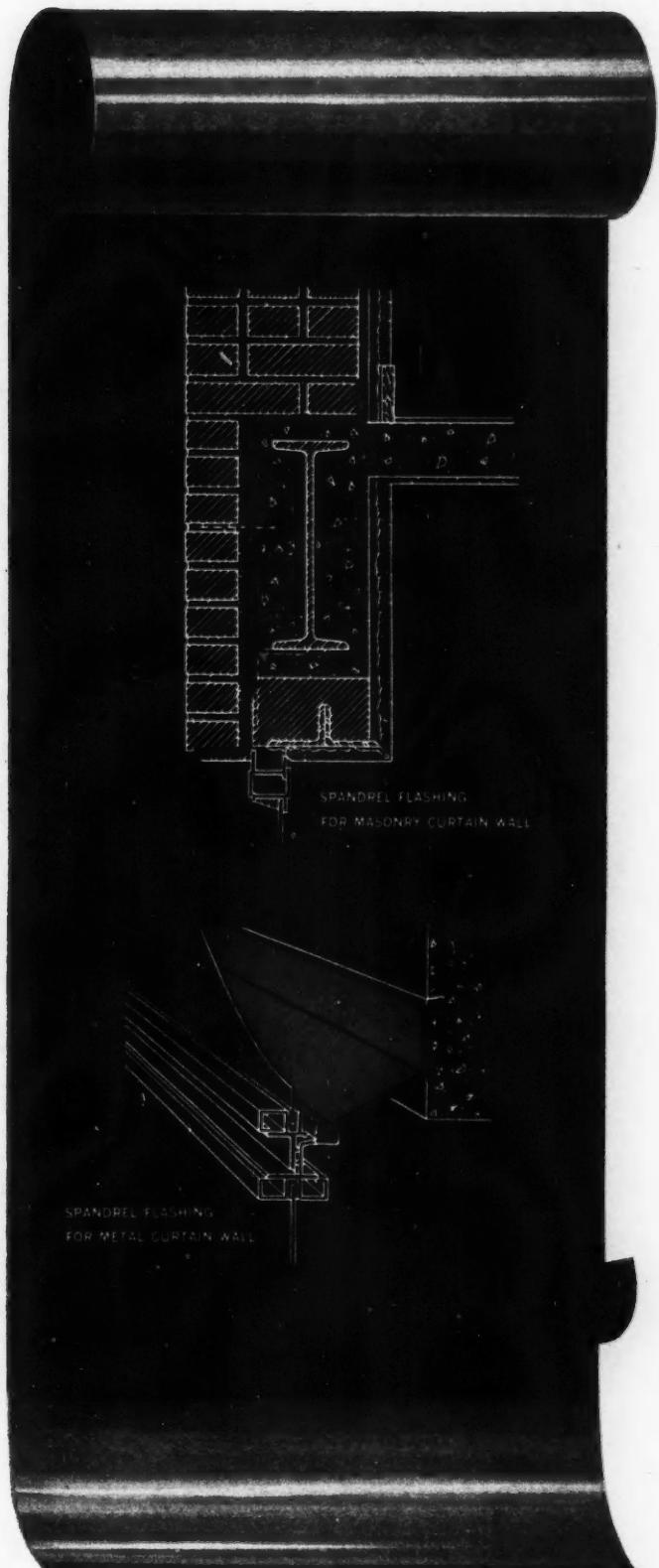
"Electro-Sheet" is pure, thin copper produced in long, wide rolls by electrodeposition. It won't rust and resists most forms of deterioration. Bonded to high-grade building papers or fabrics . . . or to asphaltic compounds . . . it makes concealed flashings you can trust.

"Electro-Sheet" Copper-bonded products are widely used in the hidden trouble spots of buildings: spandrel beams, door and window heads and sills, shower rooms and stalls, parapet walls, etc. They are flexible, easy to handle, and available in rolls up to 60" wide from building supply dealers throughout the United States and Canada.

For more information about Anaconda "Electro-Sheet" and a list of manufacturers of the flashing products, write: Anaconda American Brass Company, Ansonia Division, Ansonia, Connecticut.

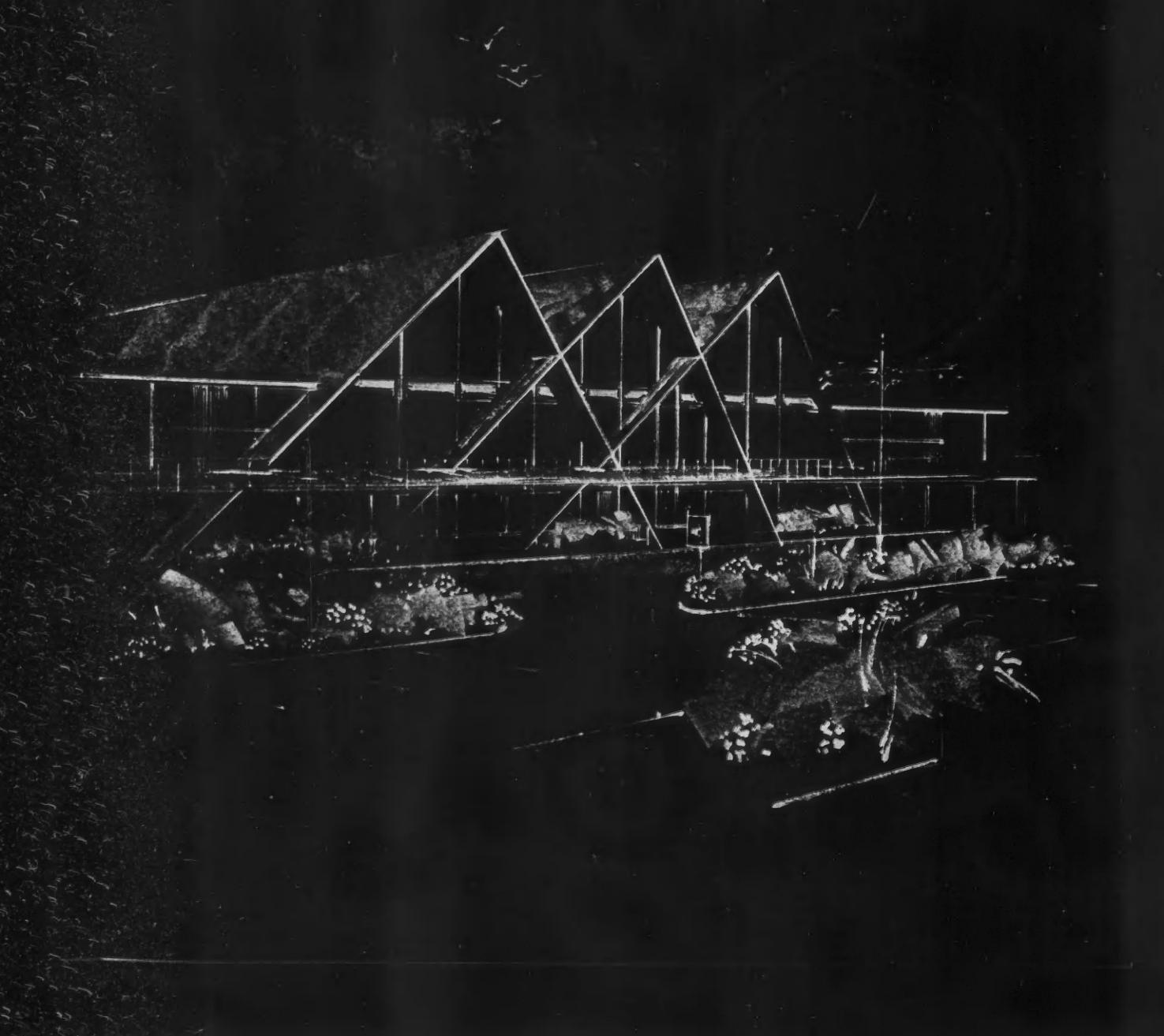
SI-1024A

**ANACONDA®**  
AMERICAN BRASS COMPANY



"Electro-Sheet" Copper is available bonded on one or both sides.

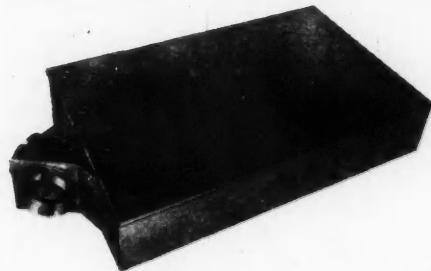
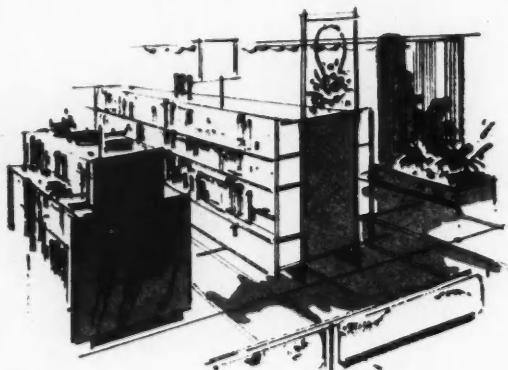
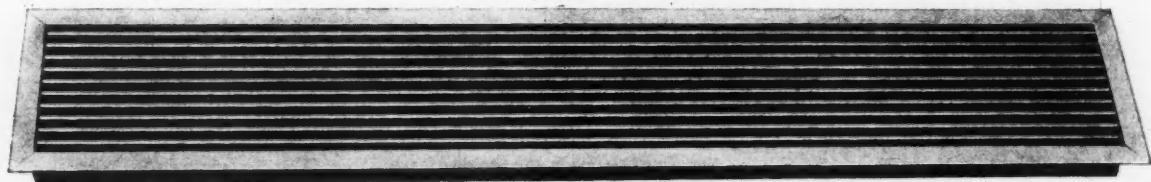
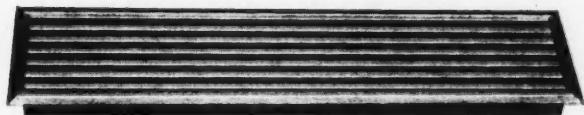
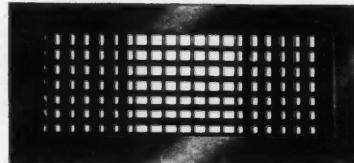
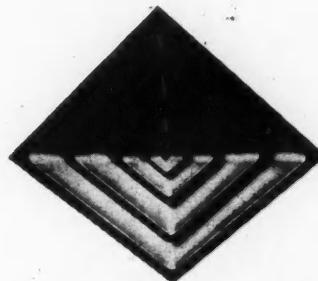
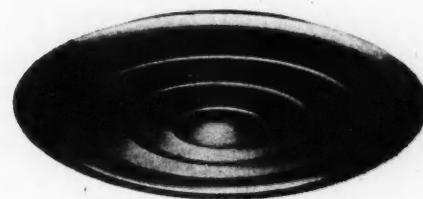
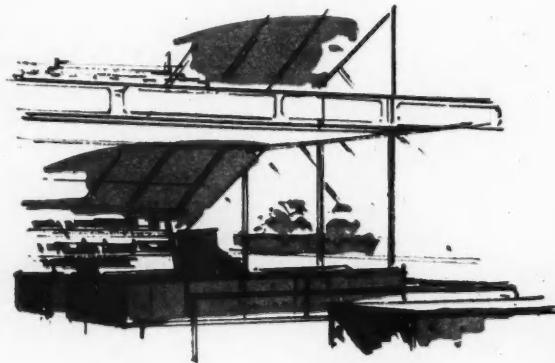
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# using TUTTLE & BAILEY AIR DISTRIBUTION EQUIPMENT

The broad range of T&B air distribution devices and accessory equipment for heating, cooling and ventilating answers every requirement of the architect, engineer and client. As the largest full-line manufacturer, T&B offers the precise piece of equipment for each job . . . setting the highest standards of appearance and performance.

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## TUTTLE & BAILEY

Division of Allied Thermal Corporation  
New Britain, Connecticut

Tuttle & Bailey Pacific, Inc., City of Industry, Calif.

DuKANE



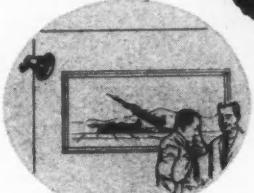
## ALL NEW 600 SERIES PAGING TELEPHONE SYSTEM



PAGING SERVICE



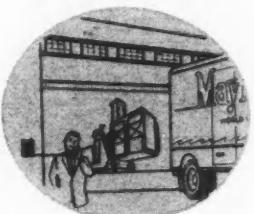
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ANNOUNCEMENTS



BACKGROUND MUSIC



SHIPPING ORDERS

### CALLS PARTY BY NAME—FREES OUTSIDE SWITCHBOARD FOR SALES PRODUCING CALLS

- Outside switchboard and telephones free for outside sales producing calls.
- Call party by name. Direct person-to-person contact without outside switchboard relay. Find personnel, even when they are not at their desks.
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NATIONWIDE NETWORK OF OVER 300 DUKANE FACTORY TRAINED  
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WRITE FOR BULLETIN!



**DuKANE**  
CORPORATION  
COMMERCIAL SOUND DIVISION  
DEPT. AR-111 / ST. CHARLES, ILLINOIS

## Product Reports

continued from page 208

### Automatic Sliding Door Opener

Sliding doors can now be operated automatically with a unit either concealed in a 4 by 4 in. transom section or surface-mounted on the door



header. The cost of installation is less than most swing-out operators, and one door can be used as both entrance and exit. The unit has only one moving part. In case of power failure the door can be operated manually. *Horton Automatics, Inc., 121 Gibson Lane, Corpus Christi, Texas*

### Roof Insulation

Rigid urethane foam is used in a roof insulation for flat built-up roofs. Panels of the insulation have tough roofing membranes laminated on both



sides of the urethane. One inch of these panels is reported to have the same insulating capabilities as two in. of glass fiber or 2½ in. of fiberboard roof insulation. Urethane does not absorb water; and the panels can be applied directly in the hot roofing bitumen and provide an immediate "walk-on" surface. *Barrett Division, Allied Chemical Corp., 40 Rector St., New York 6, N.Y.*

more products on page 222

# BENEKE

SERIES OF  
*Solid*  
SEATS

## MEET EVERY SPECIFICATION



OPEN FRONT—WITH COVER  
No. 422 designed for regular bowls.  
No. 522 designed for elongated bowls.



CLOSED FRONT—LESS COVER  
No. 422 designed for regular bowls.  
No. 522 designed for elongated bowls.



CLOSED FRONT—WITH COVER  
No. 422 designed for regular bowls.  
No. 522 designed for elongated bowls.



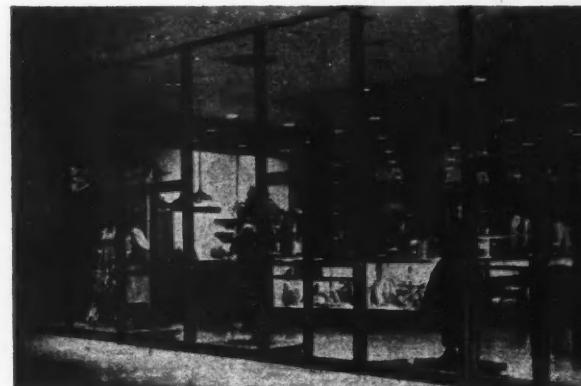
**BENEKE** CORPORATION  
COLUMBUS, MISSISSIPPI

# What's in a name?

*the unseen  
but all important factor...*

## **DEPENDABILITY...**

*the reason  
leading architects  
specify*



L. S. Donaldson Dept. Store, Edina, Minn.  
Architects: John Graham & Co.

Hope College, Holland, Mich.  
Architect: Ralph R. Calder



**ALUMINUM DOORS  
AND ENTRANCES**





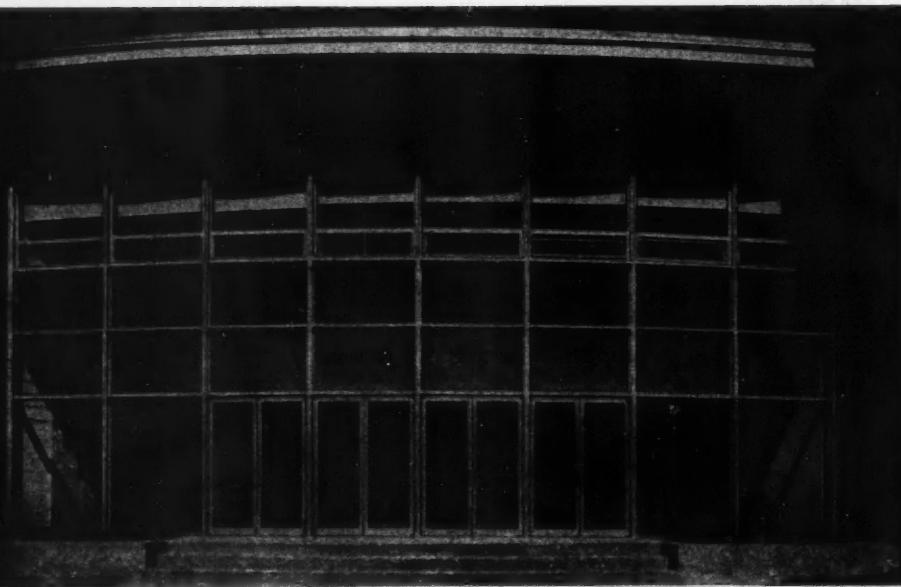
▲ Holiday Inn, Jackson, Mich.  
Architect: William W. Bond

Elizabeth Seton H. S., Bladensburg, Md.  
Architects: Thomas H. Locraft & Associates

When you need entrance doors and frames and want dependability of product and service as well as a dependable company behind the product, the name to remember is "Cupples" . . . a division of ALCOA.

Cupples aluminum entrance doors and frames—both custom and our new "40 line" of stock units—have captured the plaudits of both architects and owners. Precision made from heavy gauge extruded aluminum sections, with hairline joints and a beautiful anodized finish that is guaranteed under bond by Cupples, they are the type of products you'll be proud to specify for any job. And, what's more, they're priced competitively to fit any building budget.

Available as single or double doors with many variations in frame, you have complete design flexibility. Choose from new style offset pivots, butts or concealed overhead closers. Double acting doors on floor closers, as well as stock panic device doors are also available.



**ALCOA**

CUPPLES PRODUCTS DIVISION  
ST. LOUIS, MO.

Other outstanding features include: Complete flush glazing . . . No exposed screws . . . Simplified installation and anchoring . . . 100% vinyl glazing, front and back . . . Vinyl sealed expansion mullion . . . Stock push-pull hardware, interchangeable with custom styled hardware.

Investigate Cupples today and see for yourself why your clients get more for their money when you specify "Entrance Doors and Frames by Cupples." Write for our catalog or see Sweet's, Section 16a/Cu.

## CUPPLES PRODUCTS CORPORATION

A DIVISION OF ALUMINUM COMPANY OF AMERICA  
DOWAGIAC, MICHIGAN



## ALUNDUM NON-SLIP TERRAZZO adds walking safety to modern design

By specifying pre-cast treads of non-slip Norton ALUNDUM Terrazzo for the gracefully modern stairways in the palatial new offices of the Brookfield Federal Savings & Loan Association, Chicago, the architects not only took full advantage of the lasting beauty of terrazzo, but provided walking safety for the bank's customers and employees.

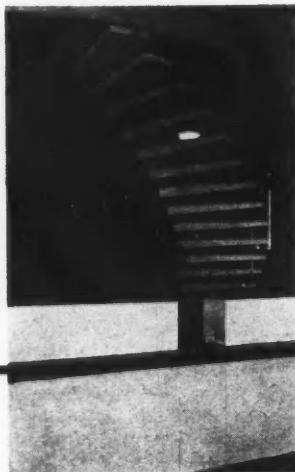
For floors, stairs and ramps in all types of buildings, both public and commercial, Norton ALUNDUM Aggregate in the proper proportion furnishes a terrazzo surface which is non-slip wet or dry, retains its initial beauty indefinitely and is exceptionally resistant to wear.

Full specifications in Norton Pages in SWEET'S or on request from us or from The National Terrazzo and Mosaic Association, Washington, D. C.

Pre-cast Terrazzo Treads by Mastercraft Art Marble Co., Inc., Chicago

Architects  
Pavlicic & Kovacevic, Chicago

**NORTON COMPANY**  
WORCESTER 6, MASS.



**NORTON**

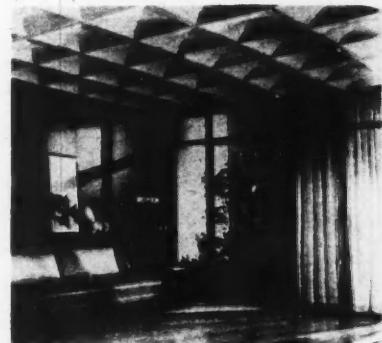
NON-SLIP FLOORS

ALUNDUM AGGREGATE for Terrazzo and Cement • ALUNDUM STAIR and FLOOR TILE  
ALUNDUM and CRYSTOLON Non-slip Abrasives

## Product Reports

continued from page 218

**Three-Dimensional Acoustic Panels**  
Two-foot-square fiber glass panels with vaulted centers absorb up to 80 per cent of room noise while provid-



ing height and interest to ceilings. The *Acousti-Shell* panels are about one-third as thick as flat sound-control panels and have a flame-spread rating of 0. Standard colors are white, blue and green, but a wide range of patterns and colors may be ordered. The panels are easy to install on metal grid systems which are suspended by wires or straps. Johns-Manville, 22 East 40th St., New York 16, N.Y.

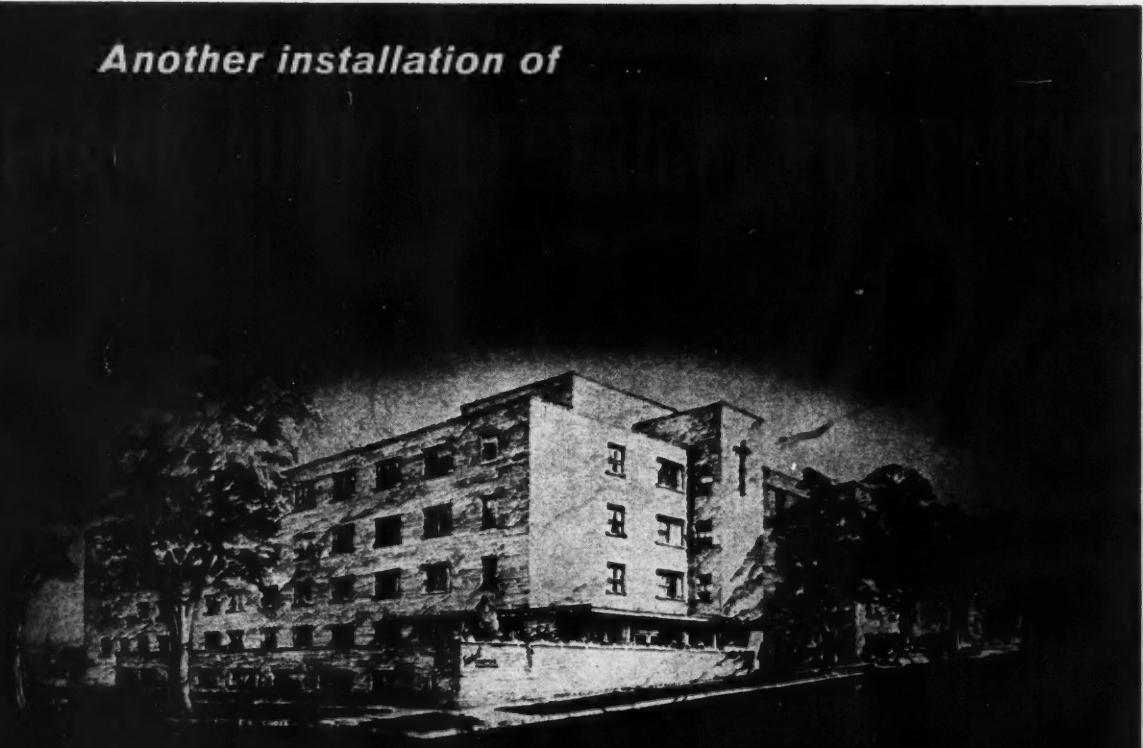
**Vinyl Tile with Slate Appearance**  
Texture of natural slate is duplicated in *Vinyl Slate* floor tile, combining the advantages of vinyl asbestos floor tile with the appearance of natural stone. Made in  $\frac{1}{8}$ -in. thickness and in 12-in. squares by a continuous



process rather than by molding, the tile may be cut into almost any shape when the material is warmed. The tile may be used both indoors and outdoors, in a wide variety of patterns. B. F. Goodrich Co., Flooring Products, Watertown, Mass.

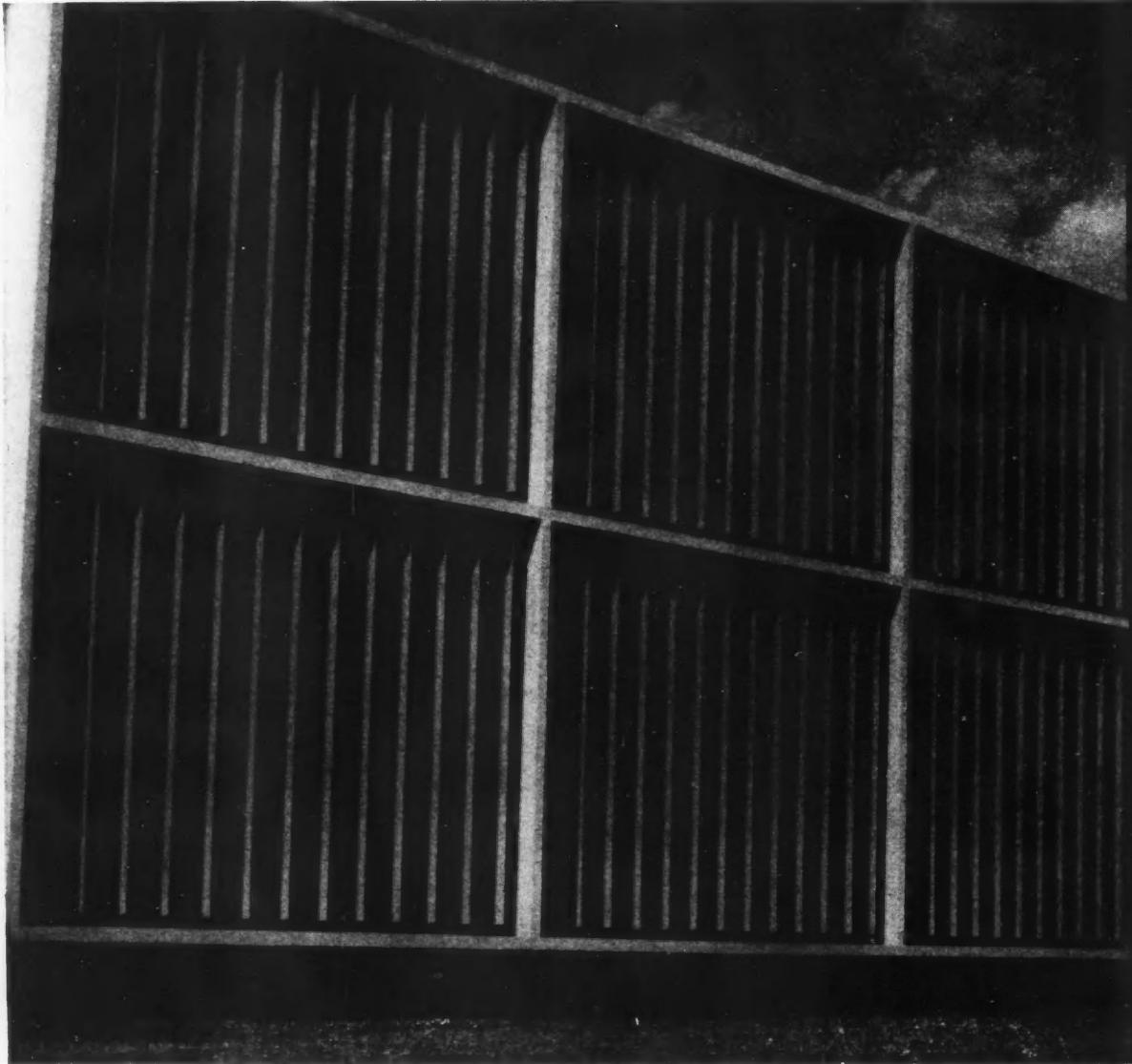
more products on page 226

#### ***Another installation of***



**ARCHITECTS:** Hills, Gilbertson & Hayes, Minneapolis  
**ENGINEERS:** Orr-Schelen, Inc., Minneapolis  
**ELECTRICAL CONTRACTOR:** D-H-W Electric Co., Minot





*The Arkla Gas air conditioning unit uses the same gas-fired boiler that heats in winter to cool in summer.*

## **As the Building grows, the ARKLA**

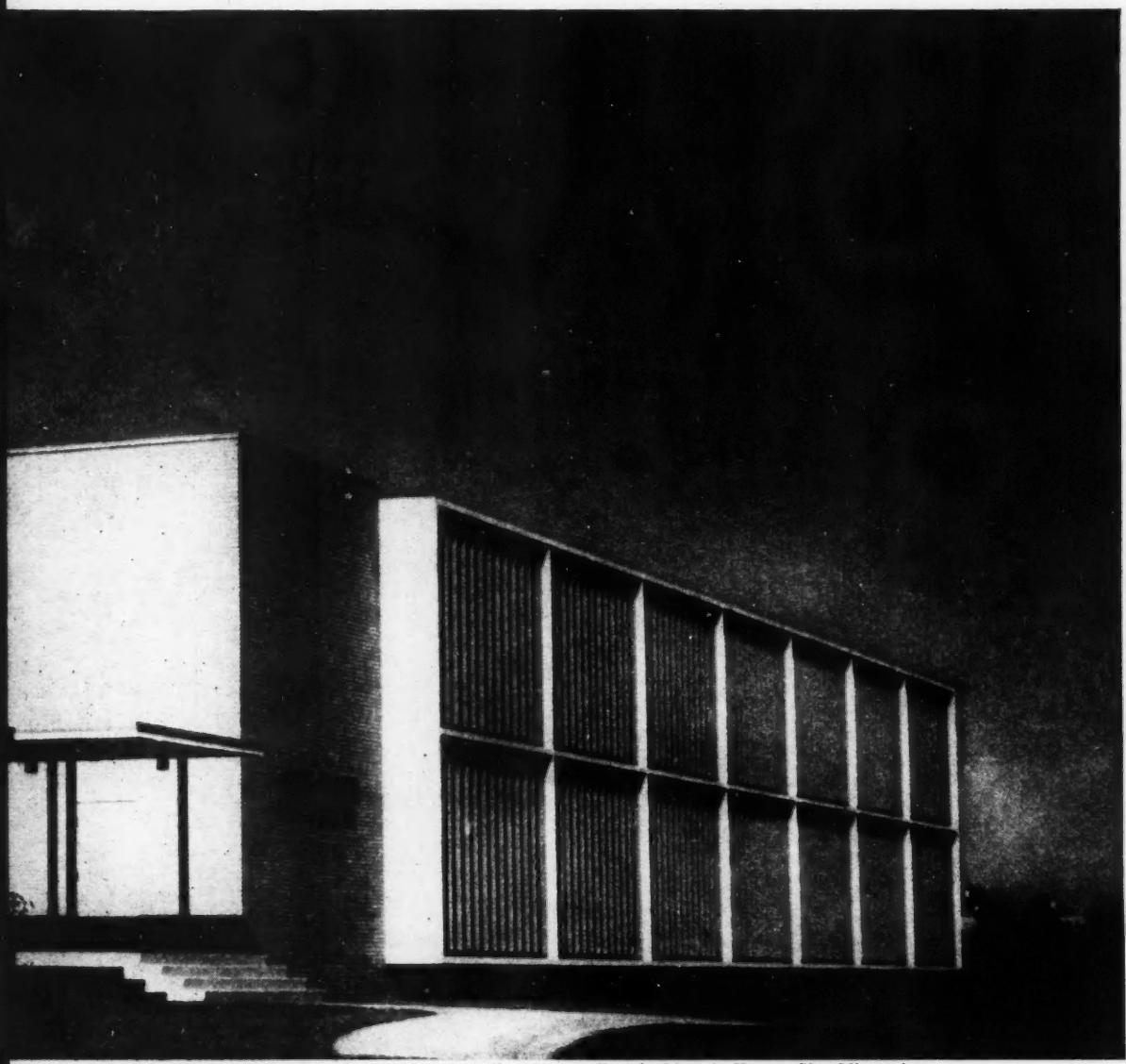
The headquarters building of Yellow Transit Freight Lines, Kansas City, Missouri, was designed to take a third story without major alterations. That's why they chose Arkla gas cooling units . . . a system that can "grow" quickly and at low cost.

When the building expands, they'll just add an Arkla unit. They go on the line right next to the rest, using the same basic piping — and steam from the same gas-fired boiler that energizes all the Arkla units.

The present cooling system includes five 25-ton Arkla Gas



*Architect: Folger & Pearson;  
Mechanical Contractors: Trong & Nichols.*



*Modern gas cools and heats this headquarters building of Yellow Freight Lines in Kansas City, Missouri.*

## **GAS COOLING system grows with it**

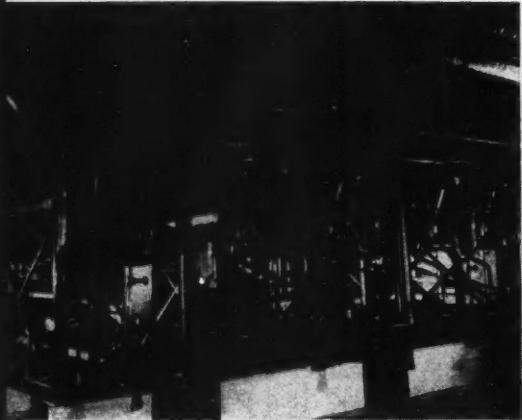
Absorption Water Chillers. These versatile units use steam from the gas-fired boiler to provide chilled water for comfort cooling. The same boiler heats in winter. And thrifty gas keeps fuel costs low.

For specific information on Arkla gas air conditioning, call your local Gas Company. Or write Arkla Air Conditioning Corporation, General Sales Office, 812 Main Street, Little Rock, Arkansas. *American Gas Association.*

**FOR HEATING & COOLING...GAS IS GOOD BUSINESS!**



*For increased cooling capacity, at low cost, additional Arkla units can be installed.*



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A NATIONWIDE ORGANIZATION



## Product Reports

continued from page 222

### Concealed Fire Escape

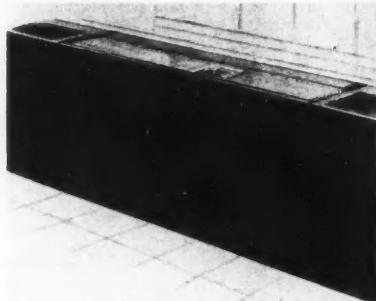
It looks like a drainpipe when closed, but even a child can flip the catch and fold out the full sized aluminum ladder which will support 2000 lb. *Safe-X-Scape* is available for two- and



three-story buildings and can be mounted outside any upstairs window. It cannot be opened from the ground. *Reynolds Metals Co.*, 19 E 47th St., New York 17, N.Y.

### Zonal Air Conditioning

Individual control of air conditioning and heating in high-rise buildings is possible with *Zoneline "42"* for cooling and *Thermaline "42"* for both cooling and heating. Both fit the same

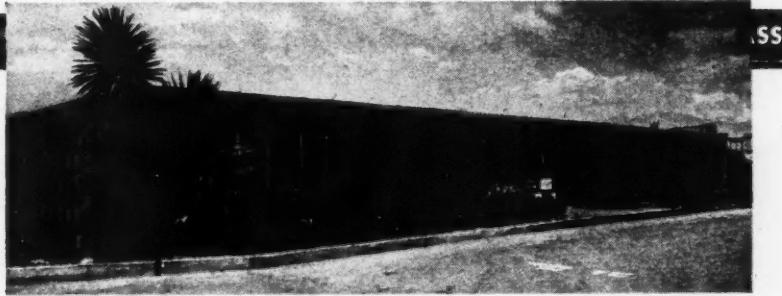


case. An adjustable baffle front provides the user with alternate air direction flows. *Zoneline "42"* is available in three cooling capacities: 8,000, 12,000 and 14,500 Btu. *Thermaline "42"* comes in 9,000/10,000 and 13,500/14,000 Btu. *General Electric Co.*, Air Conditioning Dept., Tyler, Texas

more products on page 230

# These Three California Community Hospitals Achieve Life Long PERMANENCE & DEPENDABILITY With

*Streamline*® COPPER TUBE AND FITTINGS FOR SUPPLY AND DRAINAGE SYSTEMS



West Covina Hospital



Parkview Memorial Hospital

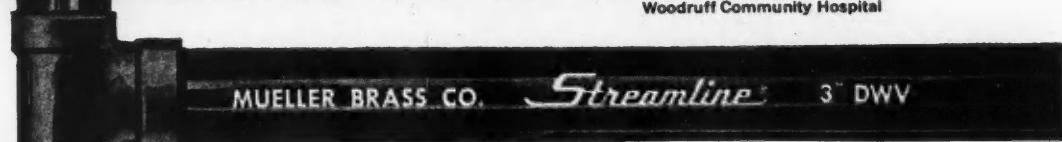
"... in operation over two years . . . the copper drainage system has been entirely trouble-free. We would recommend the use of your system and product in any modern structure."

—Hospital Administrator

In installations that must depend on clog-free, rust-proof, leak-proof, sanitary drainage, Mueller Brass Co. Streamline DWV tube and fittings are the logical choice. When compared with rustable materials, DWV Copper Tube and Fittings are **MORE ECONOMICAL** to install and will normally **OUTLAST THE BUILDING ITSELF**.



Woodruff Community Hospital



Write today for new Catalog S-361



**MUELLER BRASS CO.**  
PORT HURON 8, MICHIGAN



# How you can keep quality up and costs down

Koppers has a unique group of building materials that bear directly on the problem of keeping quality up and costs down. These Koppers products and materials are either permanent in themselves or give permanence to other materials. The following



## New Haven protects its investment with coal-tar pitch

Almost every major building you see here in New Haven has a Koppers Coal-Tar Pitch Built-up Roof—a watertight roof, bonded for 20 years of trouble-free service. Comparative studies of existing buildings have proved that coal-tar pitch built-up roofs perform better and last longer than any other type. There are now more than 370 Koppers bonded roofs in this one city protecting New Haven's investment in buildings.

And because New Haven's current redevelopment program

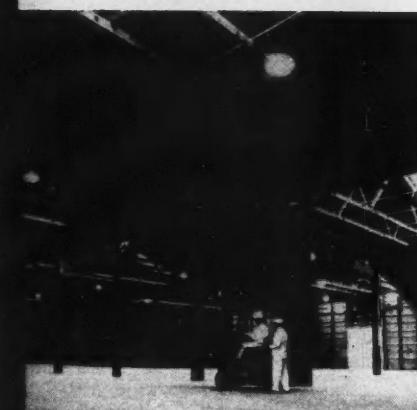
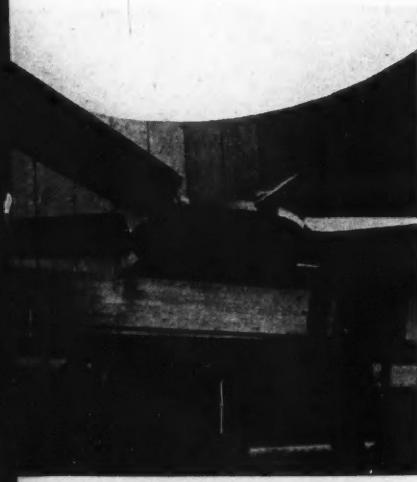
puts special attention on the use of the best possible materials, coal-tar pitch built-up roofs are being specified for new construction and modernization.

Hundreds of Koppers Built-up Roofs throughout the country have already far outlived their 20-year guarantees. In many cases protection up to 40 years has been experienced.

Check the coupon for complete information about coal-tar pitch built-up roofs.

# with Koppers building products

stories show how Koppers products can also give you greater design flexibility because they protect the basic construction materials. And this greater flexibility and permanence are frequently possible with lower initial costs and lower maintenance cost.



## No decay problem in wood cooling tower

This 22-foot diameter, six-bladed aerodynamic fan is one of four built by Koppers Metal Products Division for the water cooling tower installation at the atomic reactor testing station near Idaho Falls, Idaho. These exceedingly efficient fans help the redwood tower cool 24,000 gallons of water per minute. And in spite of the heat and moisture, the wood has lasting protection from fungus and decay because it was pressure-treated with ERDALITH® salts, an *insoluble* Koppers preservative, driven under heat and pressure deep into the cells of the wood. Check the coupon for information on pressure-treated wood and vibration-free AEROMASTER fans.

## Low budget your problem? Try pole-type buildings!

That's what H. J. HEINZ did to warehouse the stepped-up production of their Fremont, Ohio plant. They selected a pole-type structure because it could be built faster; it made a strong, permanent building that requires very little maintenance; and it cost about *half as much as other types of construction*. Koppers Pole Buildings using *pressure-treated* poles, require no excavating, no costly foundation, no custom fabrication and no long, drawn-out erection time. Interested in saving money on permanent construction? Check the coupon.

## Pipeline coating stays "picture perfect"

Engineers used a specially designed waterproof camera to check the interior of this combination sanitary-storm sewer pipe in Jersey City. Six years ago the 24" diameter concrete pipe was lined with BITUMASTIC® Super Service Black, one of the protective coal tar coatings produced by Koppers. In spite of the daily flow of 500,000 gallons of raw sewage and abrasive washings from storm sewer interceptors, the BITUMASTIC coating was still in excellent condition; no cracks, breaks or peels. For more information about Koppers *tough* coal-tar coatings, check the coupon.

### KOPPERS PRODUCTS FOR BUILDING AND CONSTRUCTION INDUSTRY

BITUMASTIC® PROTECTIVE COATINGS FOR STEEL, CONCRETE AND MASONRY

COLOR ON ALUMINUM

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AIRCOUSTAT®—Sound Traps

Industrial Sound Control

Soundproof Rooms

To: Earl F. Bennett, Mgr.-Architectural Sales  
Koppers Company, Inc., Room 1322  
Koppers Building, Pittsburgh 19, Pa.

Please send additional information about:

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 Pole-type Construction  
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Job Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

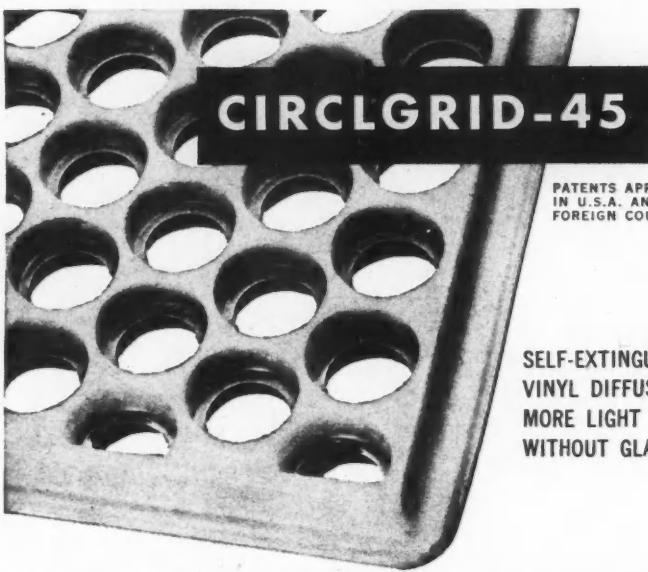
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State \_\_\_\_\_

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Chemicals & Dyestuffs  
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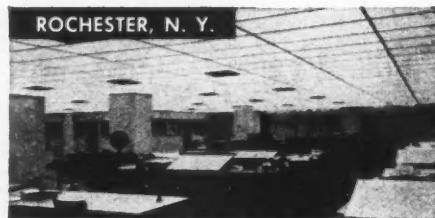


## Making friends wherever exceptional lighting is important

Entire ceilings are utilized here to create pleasing lively interiors with Circlgrid louvers. Light is equally diffused over all working areas—glare, a cause of eye fatigue, is eliminated. Employees work efficiently—people enjoy shopping or visiting under comfortable Circlgrid lighting. Whether you design, install or use lighting to achieve better surroundings, you will want the details on modern Circlgrid Diffusers.

### Licenses

ARCHITECTURAL CEILINGS  
Long Island City, New York  
BENJAMIN DIVISION  
THOMAS INDUSTRIES  
Des Plaines, Ill.  
COLUMBIA LIGHTING  
Spokane, Wash.  
DIFFUSA-LITE CO.  
Conshohocken, Pa.  
LIGHTING PRODUCTS, INC.  
Highland Park, Ill.  
LITCRAFT MFG. CORP.  
Passaic, N. J.  
LUMINOUS CEILINGS, INC.  
Chicago, Ill.  
NEWMAN SCHRANZ LIGHTING CO.  
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SYLVANIA LIGHTING PRODUCTS  
Wheeling, W. Va.  
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TROPICAL LIGHTING, INC.  
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200 FC at all work levels  
Rochester Gas & Electric Co.



5000 Sq. Ft. Circlgrid area Office Salt River Project  
Commission of Arizona



Penn College



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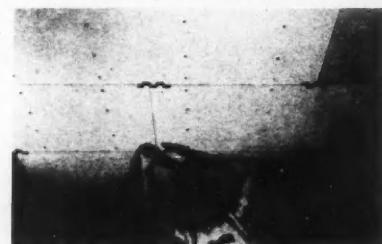
BOX 655A • ERIE, PA.

## Product Reports

continued from page 226

### Fire Resistant Ceiling Panel

Armstrong *Fire Guard* mailing panel is a mineral product designed for fast, economical installation under steel bar joists. The panels—approximately 2 by 5 ft—can be fastened to standard nailing channels with an-



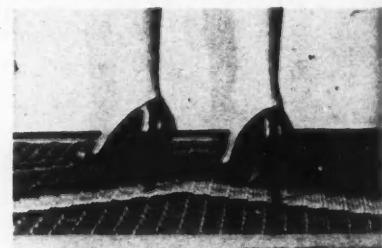
nular ring nails. End joints are reinforced with steel bridging clips at each panel intersection. The surface finish on the fire-resistant panel is smooth primed paint that provides a base for additional paint. *Armstrong Cork Co., Lancaster, Pa.*

### Air Conditioner Certification

Manufacturers producing more than 85 per cent of all room air conditioners sold in the US have joined a certification program sponsored by the National Electrical Manufacturers Assoc. Starting with 1962 models, NEMA will certify the accuracy of Btu capacity ratings of all models made by the participating companies. First publication of a directory listing certified units is scheduled for Jan. 2, 1962.

### Heel Proof Mat

Both utility and design patents have been granted for a link mat with small tapered wiping blades on the



top of each link combined with drainage slits so that dirt and moisture are trapped, but slim heels are not caught. A variety of patterns are available. *Mat Craft, 330 S. Dearborn St., Chicago 4, Ill.*

more products on page 236

BLANDIN PAPER COMPANY

BLANDIN PAPER COMPANY, Grand  
Rapids, Minn., Ellerbe and Co., Designers.

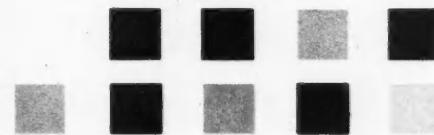
for colorful walls  
that endure... specify

## ROBERTSON PORCELAIN ON ALUMINUM

History attests to the fact that the use of porcelain enamel on metal was well known to ancient man. But only in recent years has it come into its own as a practical building material of beauty and permanence for the exterior of modern structures. Now, with a superior base of aluminum, Robertson offers wall panels, spandrels and trim in a wide choice of shapes, textures and fadeproof colors—impervious to the effects of time and weather. Use the coupon to write for literature.

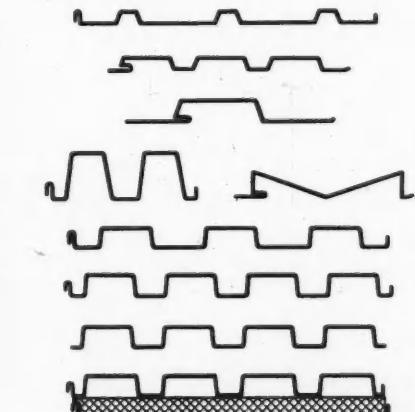
### WIDE CHOICE OF COLORS

These are just a few of the almost unlimited number of colors to choose from. Finish is available in three degrees of gloss.



CONNECTICUT LIGHT AND POWER CO., Norwalk, Conn., United Engineers & Constructors, Engineers and Contractor; Kahn & Jacobs, Consulting Architects.

### WIDE CHOICE OF SHAPES



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COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

THE HECHT CO., Hyattsville,  
Md., Lathrop Douglas, Architect.

PEPSI-COLA BOTTLING WORKS, Quincy, Ill.,  
Hafner & Strandmeyer, Architects & Engineers.



Roland W. Jutras, N.S.I.D., Director of Design for the Hotel Corporation of America, is the decorating genius behind Lancaster, New York's stunning new Charter House Motel. Mr. Jutras chose Bigelow carpets throughout, and the exclusively designed all wool face, loop-pile Wilton with its glorious golden tones provides a luxurious background for the handsome modern lobby.

Bigelow Carpet is selected by leading designers for their most important hotel and motel installations. Reasonable price, long economical service, and top performance under traffic—as well as beauty—are prime considerations in every Bigelow Carpet designed for use in public areas. Special designs, colors

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**CHARTER HOUSE**  
**MOTEL**

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IN NEW YORK'S HONEYMOON COUNTRY

and textures available. If you plan an installation, consult Bigelow's Carpet specialists about colors, patterns, weaves; at prices you can afford. No charge for this service. Contact Bigelow through the nearest sales office or by writing to Bigelow Contract Dept., 140 Madison Ave., N. Y. 16, N. Y.

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Here you have a fresh concept in lever lock performance and design. It's the new CORBIN MORTISE LEVER HANDLE LOCK!

*This lever is unique in that it springs back to the level position after every use. An auxiliary spring and positive stop in the rose keep it level and smart-looking always.*

And notice the graceful, curving sweep of the handle . . . shaped to fit the hand.

Now you can specify this stylish Lever Handle with any of the regular line of CORBIN Mortise Locks.

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THE AMERICAN HARDWARE CORPORATION  
NEW BRITAIN, CONNECTICUT

In brass, bronze or aluminum.  
Mortise Locks are available in all  
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with other CORBIN Locks.



## The Ideal Answer to Your Industrial Lighting Problems... **Sylvania's New**

Here is a totally-new series of industrial lighting fixtures designed to make your lighting fixture selection simple and positive.

Sylvania's Power-V Series includes *all of the features you want* in industrial lighting equipment—ruggedness, versatility, adaptability, ease of installation and maintenance, trimness, simplicity, high efficiency, excellent lighting characteristics . . . and all at competitive prices.

This is a completely modern fixture series from the deep-seated channel design to the wide, rugged embossed reflector.

The Power-V Series is designed to provide the high level, quality lighting job you need to increase production and efficiency and to decrease rejects and accidents. Because of the wide choice of models and lamp types, you can practically custom-design a lighting system to fit your exact illumination requirements.

Each Power-V model features:

- **Reflectors with deep embossments and ribbing for strength and rigidity.**
- **Simplicity of design and labor-saving devices which reduce installation and maintenance time.**
- **Excellent lighting characteristics with 430 ma Rapid Start and Instant Start; 800 ma Rapid Start; or any size of the powerful 1500 ma Rapid Start lamps.**
- **A low silhouette to provide neat, trim appearance.**

From every angle, we believe the Power-V Series to be the finest line of industrial lighting fixtures ever produced. May we send you the details? Just write to:

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Be Sure to Investigate Sylvania's **Power-V** Series*

# Power-V

## Series



Recommended footcandle levels are reached easily with Power-V... and you maintain quality standards, too. Designed to use 430 ma, 800 ma or all types of 1500 ma lamps.



Trim, shallow appearance assured through positive integration of channel and reflector. Low silhouette enhances any installation.

Strong, rigid fixtures featuring double-V embossments on reflector. Withstands rough handling or accidental bumps and abuse.

Clean design, minimum parts, labor-saving devices add up to simplicity of installation and maintenance.

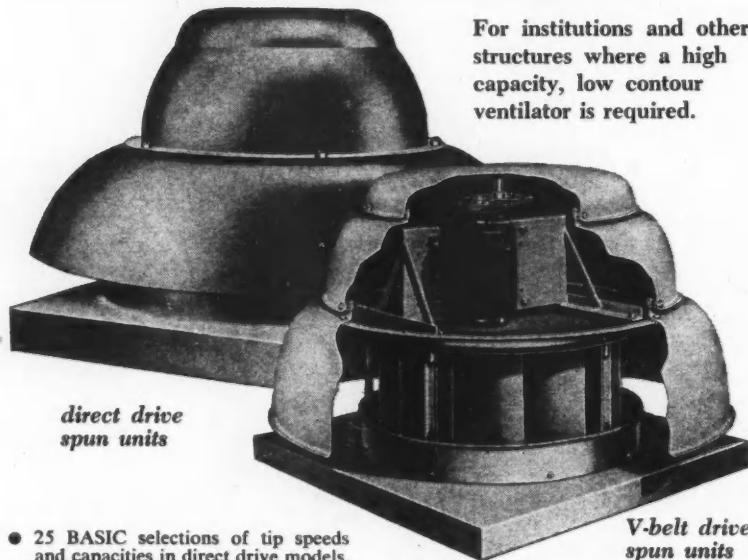
# SYLVANIA

**Burt**

# LOW PROFILE

*Spun Aluminum*

## Direct and V-Belt Drive Centriflow Fan Ventilators



direct drive  
spun units

V-belt drive  
spun units

- 25 BASIC selections of tip speeds and capacities in direct drive models.
- 64 BASIC selections of tip speeds and capacities in V-belt drive models.
- CAPACITIES from 65 to 27,648 CFM.
- HORSEPOWER ratings from 1/60 to 7½.
- SIZES from 6" through 48" wheel diameters.
- STATIC PRESSURE range from 0" through 1" W.G. (Higher static pressures on application).
- LOW PROFILE heavy gauge spun aluminum housings.
- NON-OVERLOADING backward curved, non-sparking aluminum fan wheels.
- ADJUSTABLE SHEAVES on V-belt units to change capacities at anytime.
- DAMPERS available in drop-in sleeve type, automatic back-draft or motor operated.
- BURT DESIGNED for minimum noise levels.
- AMCA CERTIFIED capacity ratings for units of 16" wheel diameter and larger.



### Send for FREE Data Book!

Write for Centriflow Data Book SPV-12C-160 and Burt Data Book SPV-101-H which supplies quick data on Burt's complete line of modern Roof Ventilators.

FAN & GRAVITY VENTILATORS • LOUVERS • SHEET METAL SPECIALTIES

**The Burt Manufacturing Company**

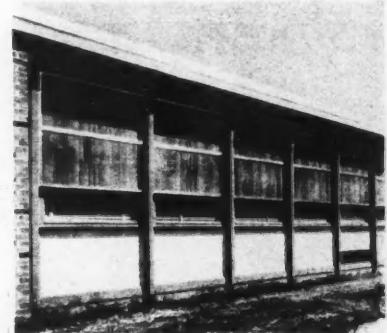
48 E. South St. AKRON 11, OHIO  
MEMBER AIR MOVING & CONDITIONING ASSOCIATION, INC.

## Product Reports

continued from page 230

### Aluminum Combination Windows

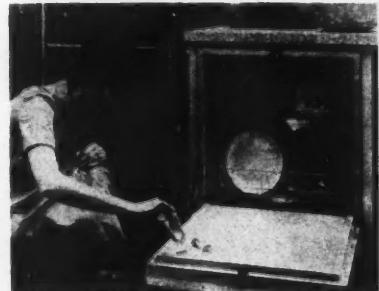
Aluminum combination windows with built-in sun control louvers help reduce room temperature by as much as 15 per cent. The miniature louvers made by Kaiser Aluminum allow diffused light to enter. The louvers are



sealed between two panels of glass and pressure fitted into a 1 1/4 in. wide channel frame of .040 formed aluminum sheet. In this way the aluminum screen is protected by the glass panels and provides a permanent solar heat block. *Humphrey Products, Inc.*, 719 E. Zimmerly St., Wichita, Kansas

### Gas Dishwasher

Final rinse water in Preway's gas dishwasher is preheated to 180°F, the temperature set by health codes for commercial dishwashers, while the washing action is done at 160°F. Both



temperatures are above the 140°F found in most homes, and are obtained through a built-in gas water heater. The unit incorporates rotating arms which insure better distribution of washing and rinsing water, thereby allowing greater packing flexibility. *Preway, Inc.*, Wisconsin Rapids, Wisc.

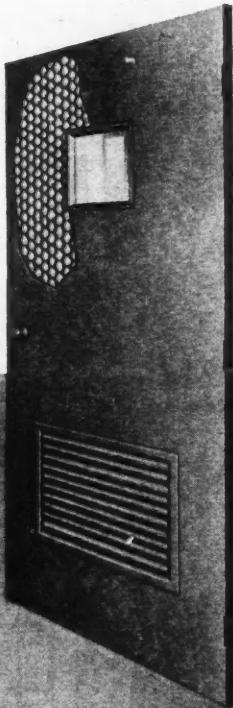
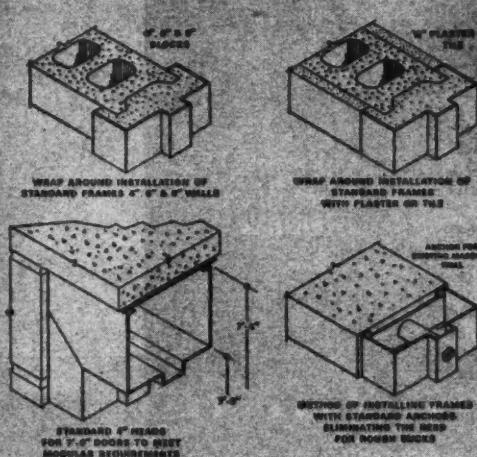
more products on page 240

# STEELCRAFT

*The finest name in...*

# METAL DOORS and FRAMES

Another suggestion  
from the Steelcraft  
Architectural  
Detail File.



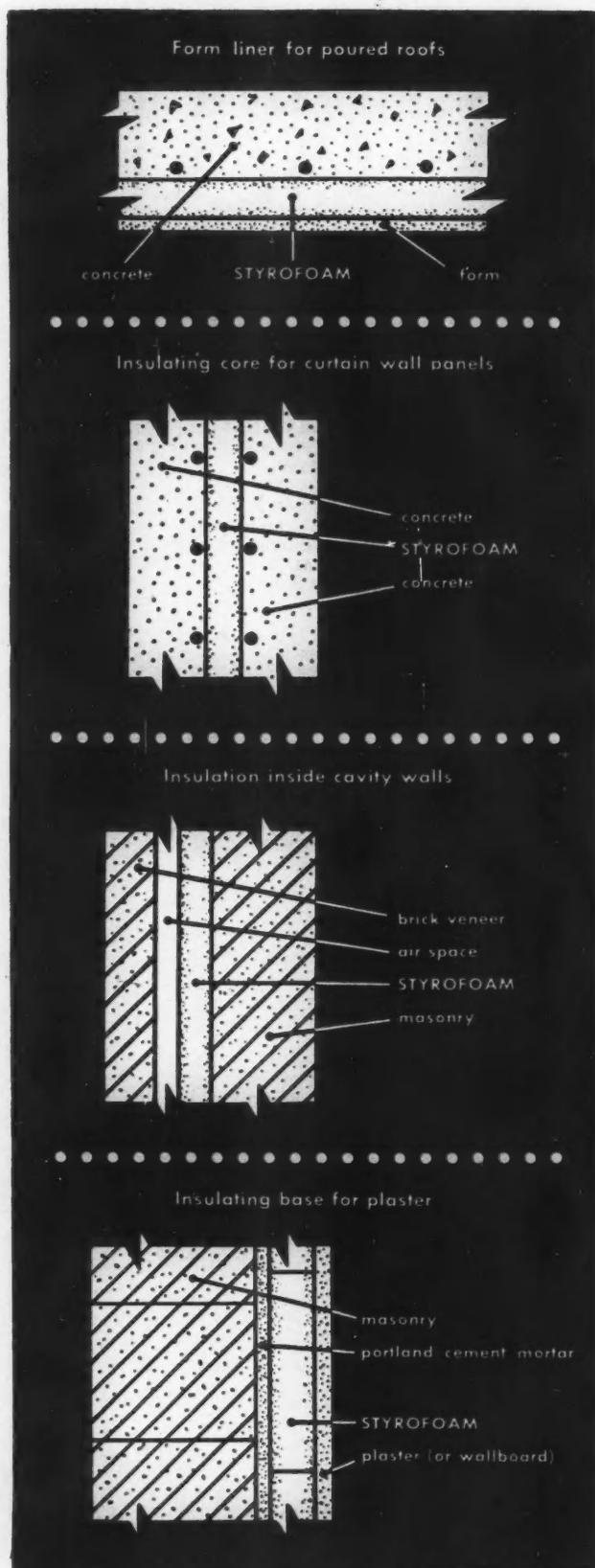
**Honeycomb core**—A Steelcraft development that provides new strength! A honeycomb core is permanently bonded to two layers of steel...deadens sound, adds ruggedness.

Steelcraft's Indianapolis distributor, William Hanley, AHC, Central Indiana Hardware Co., discussing frame details and versatility with Werner Leeser, Chief Engineer, The Steelcraft Manufacturing Co.

Steelcraft offers unmatched versatility with frames for all types of masonry construction, stocked locally in an endless variety of jamb depths and sizes...all designed to fit every Steelcraft door. Call your Steelcraft distributor for professional assistance in locally coordinating hardware, approval drawings and schedules for all of your metal doors and frame problems.

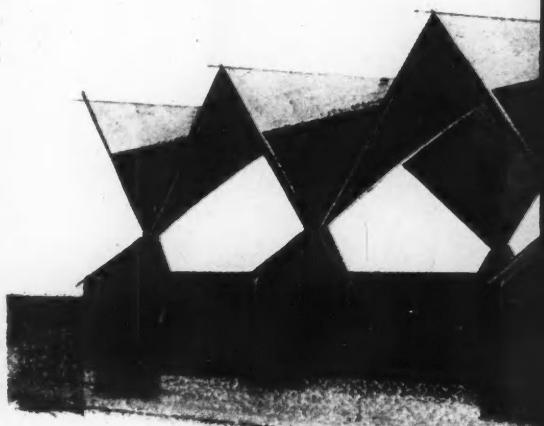
THE STEELCRAFT MANUFACTURING COMPANY  
9017 Blue Ash Road, Cincinnati 42, Ohio





**Styrofoam simplifies construction  
of insulated ...**

- **THIN-SHELL ROOFS**
- **CONCRETE CURTAIN WALLS**
- **CAVITY WALLS**
- **POURED CONCRETE AND BLOCK WALLS**



# STYROFOAM®

solves design problems, speeds construction  
... and adds permanent insulating values!

Styrofoam brand insulation board provides triple benefits for commercial building construction. Proved by long use, Styrofoam retains superior insulating values year after year . . . permits use of new, more efficient techniques . . . and cuts the time and cost of insulated construction.

Styrofoam insulation is both a superior insulating material and a rigid structural material. Styrofoam has a low "K" factor that stays low, because water and water vapor don't penetrate it and build up inside. Buildings stay more uniformly warm (or cool) and dry in any weather, saving on heating and cooling costs.

Styrofoam insulation makes new techniques practical. For example, lightweight, insulated concrete curtain walls can be produced quickly using Styrofoam as the core. Positive keying

action to concrete minimizes need for fasteners or ties. The final concrete-insulation-concrete "sandwich" is strong, lightweight and economical.

For thin-shell application, Styrofoam insulation is a valuable construction material and insulation. For form work of all kinds, it serves as form liner, permanent insulation, and vapor barrier applied in a single step! The use of Styrofoam in this way provides a minimum 70% reduction in heat loss.

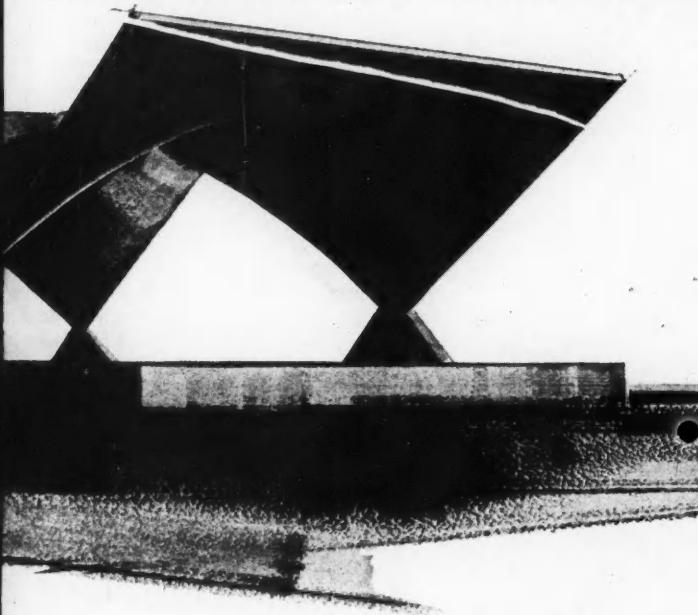
**Insulating plasterbase**—Styrofoam insulation eliminates the need for furring and lathing when insulating masonry walls. Just adhere Styrofoam to the wall with portland cement mortar, then apply plaster . . . or wallboard, if you wish. The use of Styrofoam as an insulating plasterbase provides 35 to 45% reduction in heat loss.

Cavity-wall buildings stay warm and dry when Styrofoam insulation is in

the cavity. Simply adhere it to the outside face of the inner wythe. Because of its high resistance to water vapor, Styrofoam eliminates the need to build in a separate vapor barrier. The addition of Styrofoam to cavity-wall construction provides a 50 to 60% reduction in heat loss.

Low-cost Styrofoam has no food value to attract insects, and will not rot. Installation and handling are quick and easy. For more information on Dow Building Products, write THE DOW CHEMICAL COMPANY, Midland, Mich., Plastics Sales Dept. 1502N11.

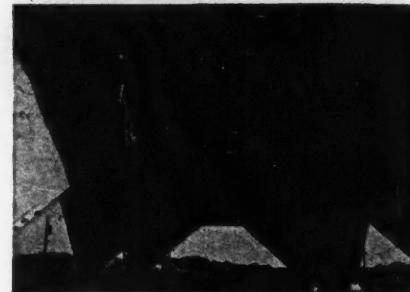
*Styrofoam is a registered trademark of The Dow Chemical Company. It is applied only to the homogeneous expanded polystyrene made according to an exclusive Dow process. Styrofoam brand insulation board is available only from Dow and its authorized representatives.*



This unique h-p roof was poured over Styrofoam, which was finished on the underside with two coats of plaster and a sprayed acoustical finish.



Styrofoam is laid over wood form and covered with reinforcing.

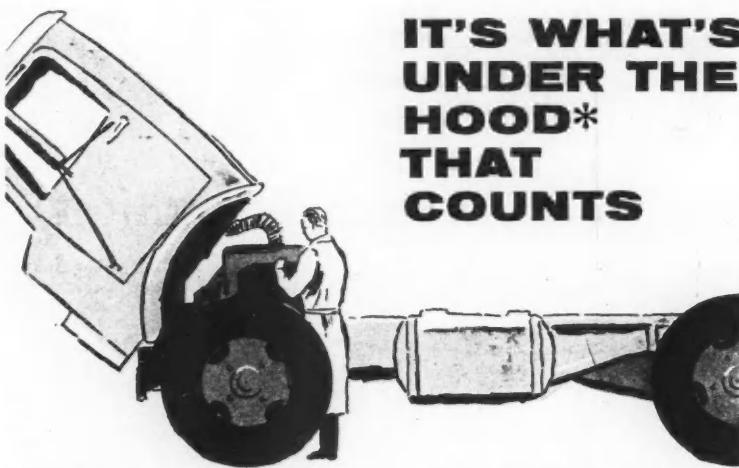


After removing form boards, the Styrofoam in the ceiling is ready for finishing.

THE DOW CHEMICAL COMPANY



Midland, Michigan



## IT'S WHAT'S UNDER THE HOOD\* THAT COUNTS

Like the motor in your car or truck, what's under the hood of your **Kinneair Rolling Door** is as important a part of its extra value as the part that is always in view.

Concealed in the hood of each **Kinneair Rolling Door** is a mechanism so skillfully engineered and ruggedly built that it has no equal for long-lasting, low-cost efficiency.

In fact, the rugged precision of Kinneair's under-the-hood mechanism is one of the reasons it so seldom needs to be seen (just as you seldom look under the hood of a car with a trouble-free motor).

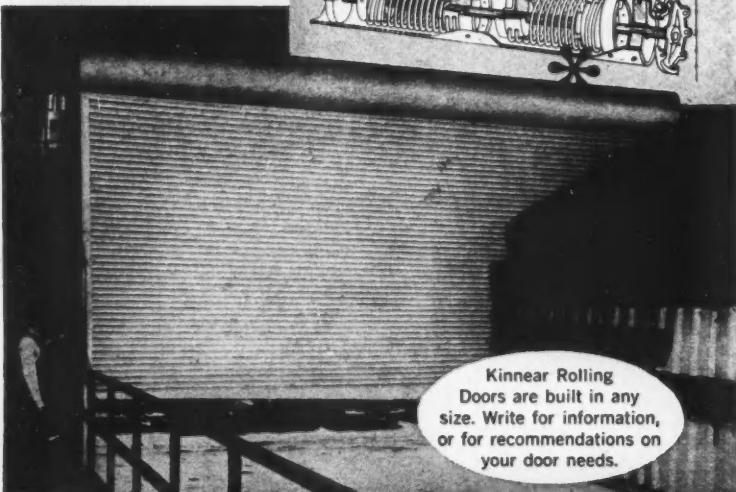
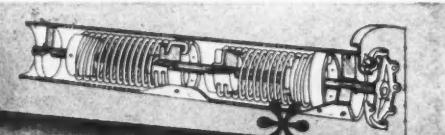
Although this sometimes makes the first cost of **Kinneair Rolling Doors** a little bit higher than "copies," it also assures lowest-cost door operation and maintenance.

\*\*Hot-dip galvanizing adds 1.25 ozs. pure zinc to each sq. ft. of metal (ASTM standards).

Under-the-hood quality is also one of the reasons so many **Kinneair Rolling Doors** have served continuously — often in daily use — for more than half a century!

In addition, **Kinneair Rolling Doors** offer coiling upward action that clears the entire opening quickly . . . saves floor, wall and ceiling space . . . keeps the opened door curtain out of the reach of damage by wind or vehicles.

When fully closed, **Kinneair Rolling Doors** provide extra protection against wind, weather, vandalism, trespass—even against fire. (Heavy galvanizing\*\* resists corrosion, and Kinneair Paint-Bond makes any finish coating you apply adhere immediately and last longer.)



Kinneair Rolling  
Doors are built in any  
size. Write for information,  
or for recommendations on  
your door needs.

**The KINNEAIR Mfg. Co.**

FACTORIES:

1860-80 Fields Ave., Columbus 16, Ohio  
1742 Yosemite Ave., San Francisco 24, Calif.  
Offices and Agents in All Principal Cities

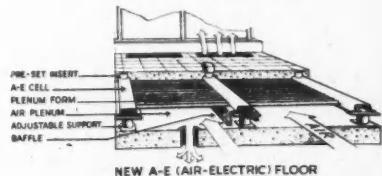
**KINNEAIR**  
ROLLING DOORS  
Saving Ways in Doorways

## Product Reports

continued from page 236

### Floor System

Mechanical and electrical systems are combined in the "A-E (air-electric) Floor" which provides for plenum distribution of conditioned air and cellular chases for power, telephone and other wiring. It may be used with any structural system in new construction and is adaptable for modernizing older structures. A secondary slab floor containing wire



NEW A-E (AIR-ELECTRIC) FLOOR

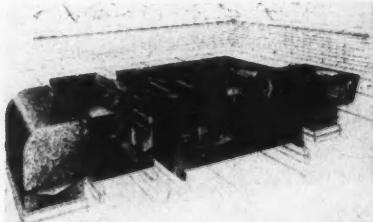
chases rests on adjustable steel spacers supported by the main structural slab. The air space thus created carries conditioned air to either floor or ceiling air diffusers. The plenum can be varied in height and sub-divided with baffles for zoning. *Granco Steel Products Co., 6506 N. Broadway, St. Louis 15, Mo.*

### Industrial Fluorescent Fixtures

Modern design and rugged construction are main features of Sylvania's Power-V series of industrial fluorescent lighting fixtures. The fixtures are adaptable to 430 ma, 800 ma and 1500 ma lamps. *Sylvania Lighting Fixtures, Wheeling, West Virginia*

### Roof Top Heaters

A lower silhouette is a feature of a new line of roof top heaters offered with a choice of gas-fired, oil-fired or combination fuel models. They are



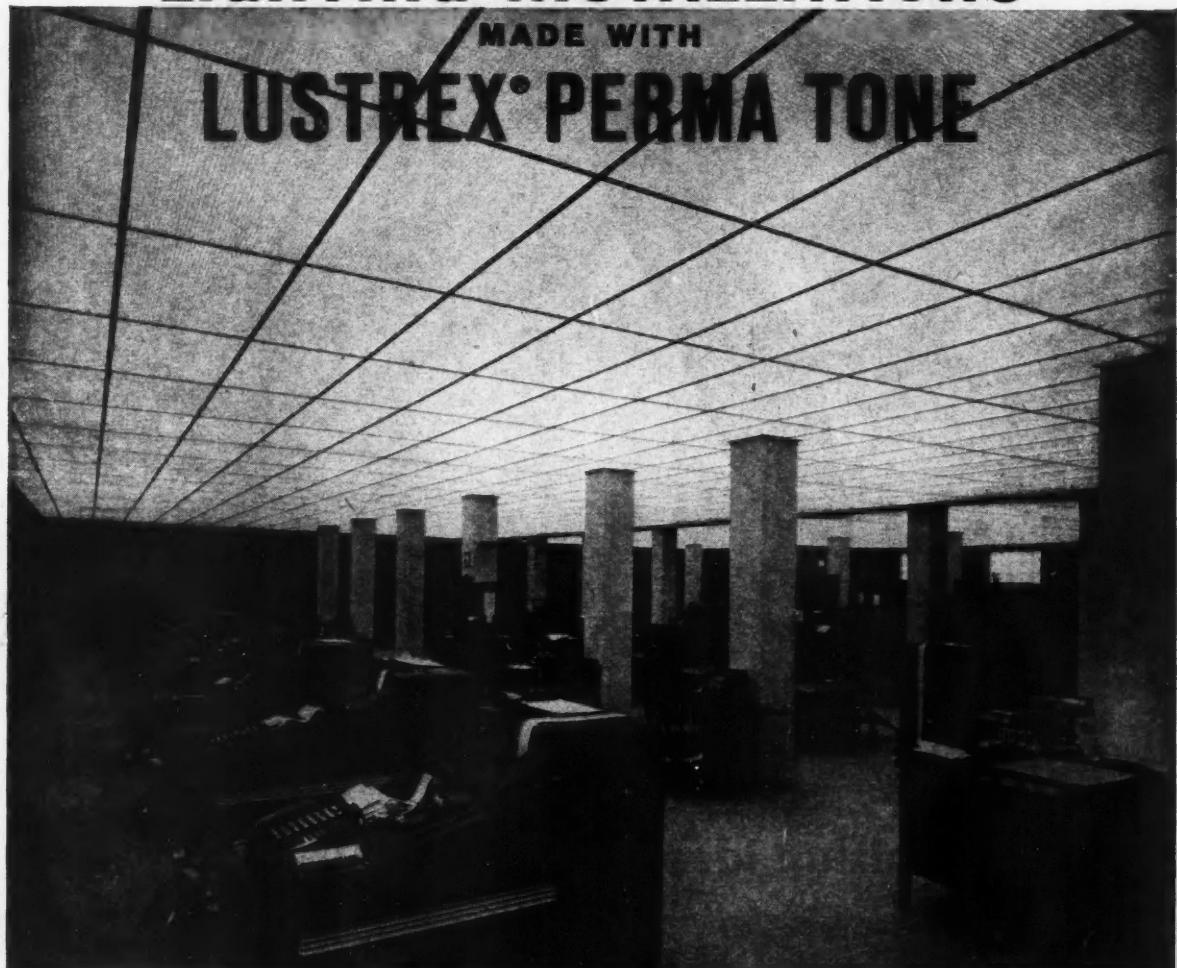
designed for heating only, heating and ventilating, and heating-cooling-ventilating. The heating output range is 28,000 to one million Btuh. Largest unit is 65 in. high. Additive direct expansion evaporator units give 10 to 45 tons of cooling. *Lennox Industries Inc., Marshalltown, Iowa*

Spruce up the old . . . Accent the new

# LIGHTING INSTALLATIONS

MADE WITH

## LUSTREX® PERMA TONE



Heartland Office Building, National Commercial Bank & Trust Co. of Albany, N.Y. Electrical Design Engineer: Walter S. Stewman, Albany, N.Y. General Contractor: Rosch Bros. Electrical Contractor: H. A. Collman Electrical Co., Inc.

Luminous ceilings, luminaires, louvers, refractors, diffusers and modules made with Monsanto Lustrex Perma Tone Styrene have given years of service as a dramatic and effective source of light in hundreds of buildings of all types—both new and old.

In major renovation projects, these lighting installations are an economical and easy way to brighten up dark corners with strong, yet softly diffused illumination. Over-high ceilings can be brought down and unsightly beams and pipes can be masked behind a ceiling of bright new beauty. In new construction, lighting installations made with Lustrex Perma Tone give you a highly flexible means of creating unique decorative effects and accents.

Fixtures made of Lustrex Perma Tone deliver uniform surface brightness and excellent color stability. Exceeding IES-NEMA joint specifications for ultraviolet light stabilized styrene, Perma Tone assures the whitest of whites or a wide range of molded-in clear, permanent colors. Dimensionally stable, they are also light in weight for easy handling, installation and maintenance. To make sure you get this combination of performance at an economical cost, specify installations made with Monsanto Lustrex Perma Tone.

### MONSANTO DESIGNER IN PLASTICS

If you would like additional data on Lustrex Perma Tone in lighting, and the names of manufacturers of fixtures molded of Lustrex Perma Tone, send coupon below to Monsanto Chemical Company, Plastics Division, Room 818, Springfield 2, Mass.



#### MONSANTO CHEMICAL COMPANY, Plastics Division Room 818, Springfield 2, Mass.

Please send me comprehensive report on general-purpose and impact Lustrex Perma Tone Styrene, and other data on styrene in lighting. Also list of manufacturers of lighting fixtures of Perma Tone.

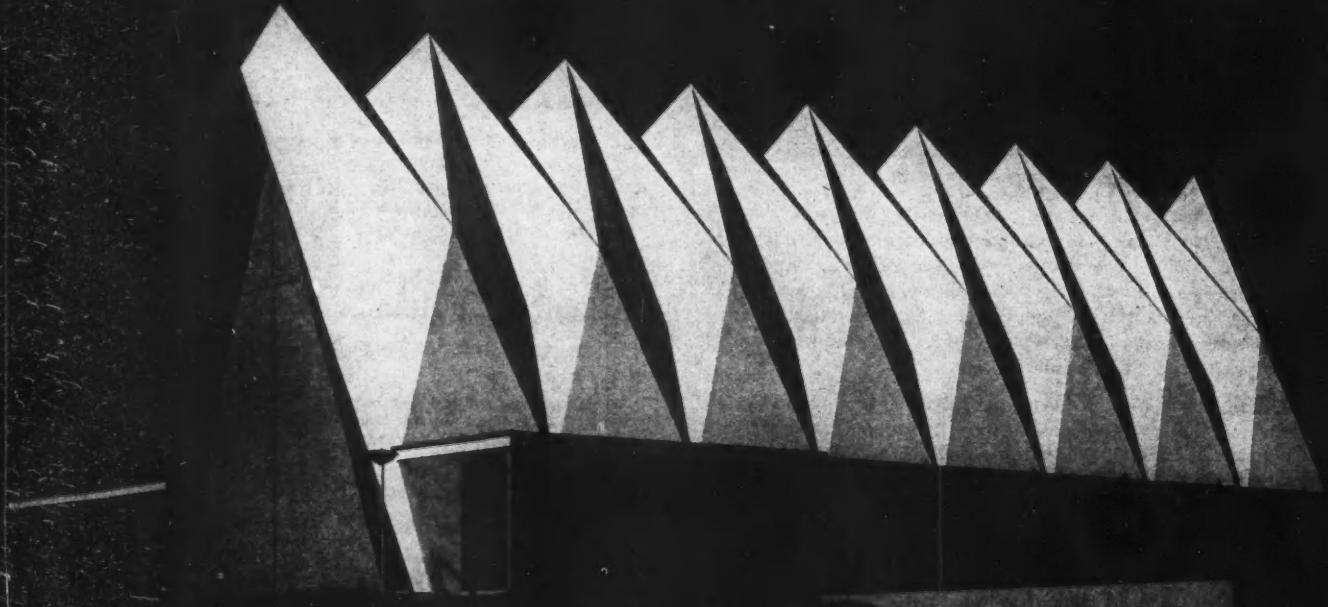
NAME \_\_\_\_\_ TITLE \_\_\_\_\_

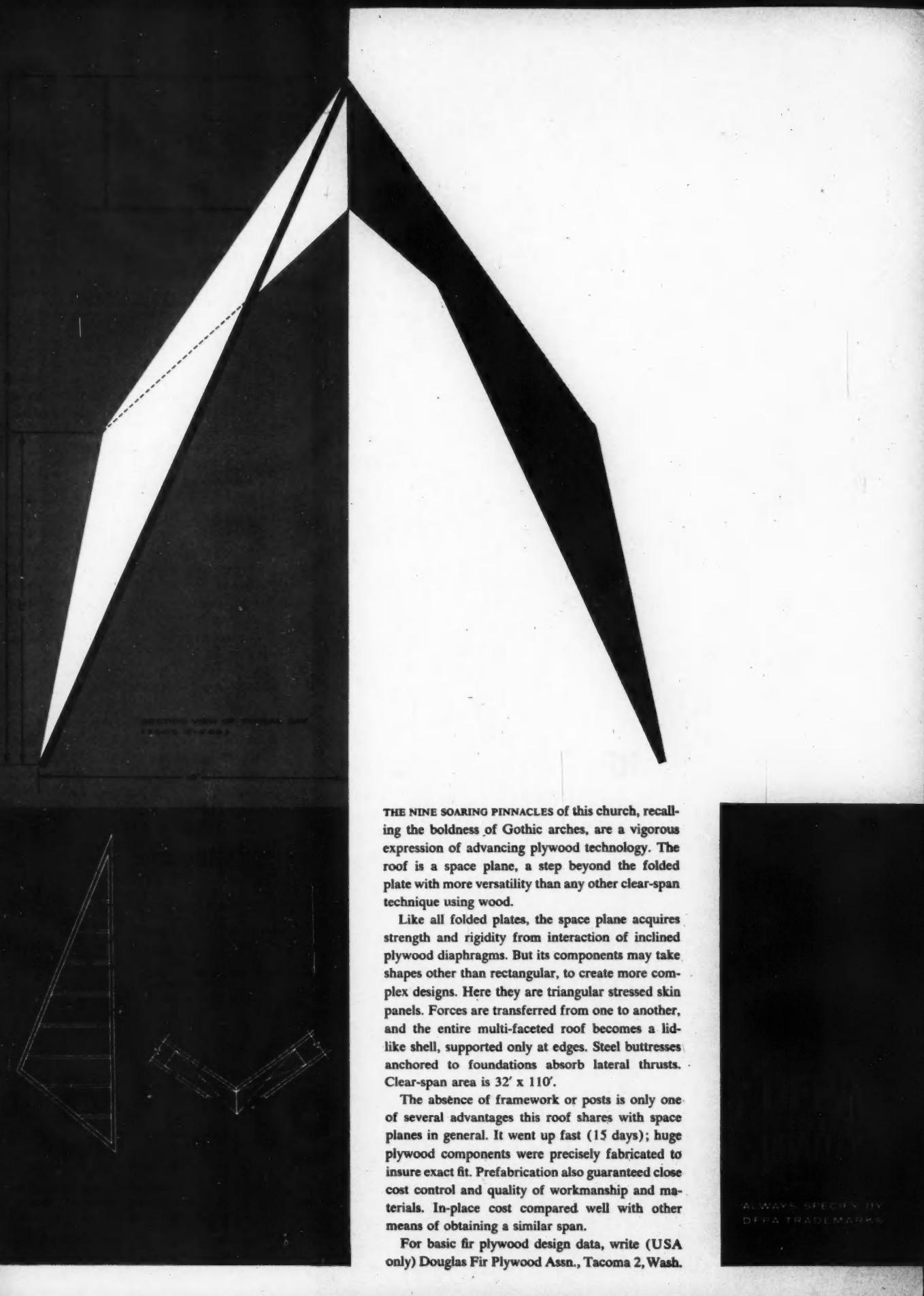
COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

**the most exciting ideas take shape in fir plywood**





THE NINE SOARING PINNACLES of this church, recalling the boldness of Gothic arches, are a vigorous expression of advancing plywood technology. The roof is a space plane, a step beyond the folded plate with more versatility than any other clear-span technique using wood.

Like all folded plates, the space plane acquires strength and rigidity from interaction of inclined plywood diaphragms. But its components may take shapes other than rectangular, to create more complex designs. Here they are triangular stressed skin panels. Forces are transferred from one to another, and the entire multi-faceted roof becomes a lid-like shell, supported only at edges. Steel buttresses anchored to foundations absorb lateral thrusts. Clear-span area is 32' x 110'.

The absence of framework or posts is only one of several advantages this roof shares with space planes in general. It went up fast (15 days); huge plywood components were precisely fabricated to insure exact fit. Prefabrication also guaranteed close cost control and quality of workmanship and materials. In-place cost compared well with other means of obtaining a similar span.

For basic fir plywood design data, write (USA only) Douglas Fir Plywood Assn., Tacoma 2, Wash.

ALWAYS SPECIFY BY  
DEPA TRADEMARKS



## Office Literature

continued from page 206

### Partition Catalog

An eight-page, two-color brochure contains specifications, detail and elevation drawings, and photographs of movable, free-standing, industrial and toilet partitions. *Marnay Sales Division, Rockaway Metal Products Corp., 41 E. 42nd St., New York 17, N.Y.*

### Terne Roofing

(A.I.A. 12-A-31) Advantages and recent installations of seamless terne roofing are included in an eight-page bulletin. Specifications are also included. *Follansbee Steel Corp., Follansbee, W. Va.\**

### Acoustical Products

More than 440 types and qualities of acoustical products, ranging from perforated wood fiber acoustical tiles to integrated air conditioning-ventilating acoustical ceilings, are included in a 30-page illustrated catalog. Detailed technical information is provided. *Elof Hansson, Inc., Acoustical Division, 711 Third Ave., New York 17, N. Y.\**

### Indirect Luminous Ceiling

Brochure titled "Lighting in the Right Direction Engineered for Architects" features a lighting concept which combines versatility, efficiency and economy. *Silvray Lighting, Inc., 100 W. Main St., Bound Brook, N.J.*

### Heating and Cooling

Technical data on industrial heating, cooling and heat transfer with *Panelcoil* are included in *Technical Data Bulletin 356*. It also provides charts and tables for figuring heating load, selecting heating surface, short cuts, etc. *Dean Products, Inc., 1042 Dean St., Brooklyn 38, N.Y.*

### Fire-Protected Wood

(A.I.A. 19-A-3) Information about the economy and safety of Koppers *Non-Com* fire-protected wood is available in *Bulletin W-365*. The wood is pressure-impregnated with inorganic chemicals that protect it from fire, termites and decay. The six-page bulletin gives case histories. *Wood Preserving Division, Koppers Co., Inc., Pittsburgh 19, Pa.\**

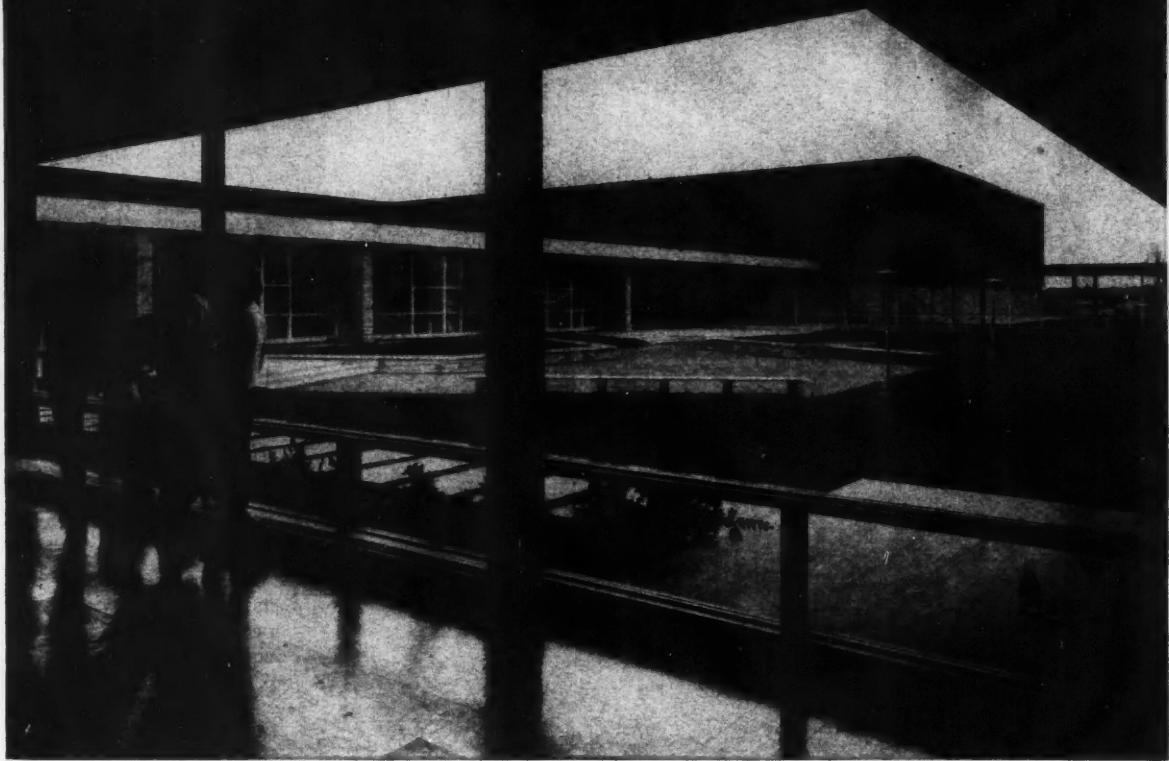
\*Additional product information in *Sweet's Architectural File*

Since

# HOPE'S WINDOW WALLS

1878

STEEL WINDOWS HAVE THE STRENGTH AND RIGIDITY THAT NO OTHER WINDOW CAN MATCH



HOMewood-FLOSSMOOR COMMUNITY HIGH SCHOOL, FLOSSMOOR, ILLINOIS

*Perkins & Will, Architects*

*The Edward Gray Corp., Contractors*

This award winning, one-floor-plan school consists of three building units connected by glazed corridors. It provides, in addition to 32 academic classrooms, 14 rooms for special work in fine and industrial arts, laboratory sciences and a library, plus a gymnasium and a cafeteria.

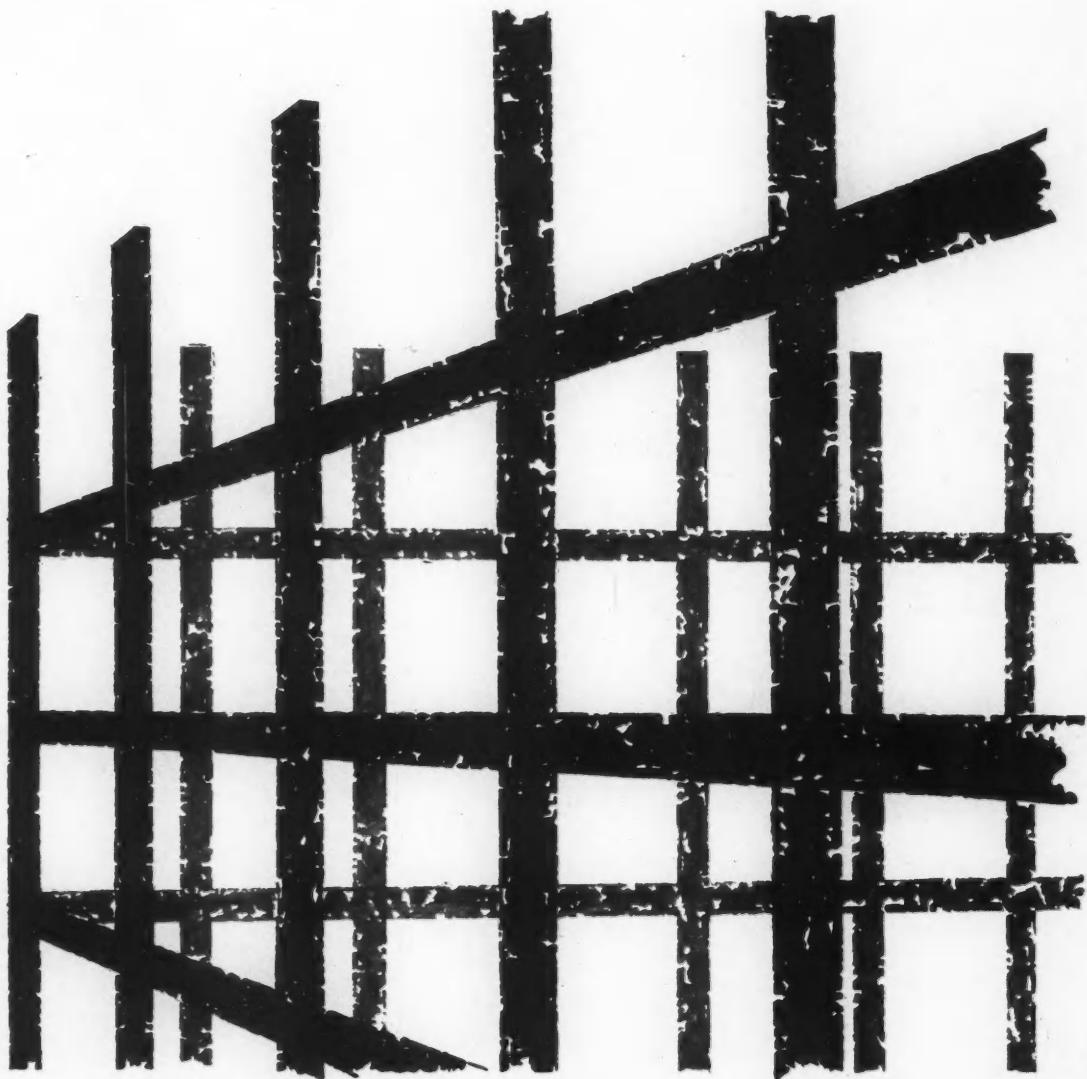
Much valuable use is made of Hope's Single Floor Window Walls with pressed metal sub-frames holding fixed glass and Hope's Heavy Intermediate

Projected Windows. Here, as in all school work, the architect is aided by complete freedom in layout for the wide variety of special facilities with provisions for all openings at the most convenient points.

The experienced services of Hope's Engineering Department and Erection Crews assures, to every builder using Hope's Window Walls, the full benefit of Hope's unsurpassed quality. *Write for Bulletin Number 169.*

## HOPE'S WINDOWS, INC., Jamestown, N.Y.

HOPE'S WINDOWS ARE MADE IN AMERICA BY AMERICAN WORKMEN



## New support for lowered construction costs

Armco Steel Corp.  
The Babcock & Wilcox Co., Tubular Products Div.  
The Carpenter Steel Co., Alloy Tube Div.  
Jones & Laughlin Steel Corp., Electricweld Tube Div.  
National Tube Div., United States Steel Corp.  
Ohio Seamless Tube Div., Copperweld Steel Co.  
Republic Steel Corp., Steel and Tubes Div.  
Sawhill Tubular Products, Inc.  
Southeastern Metals Co.  
The Standard Tube Co.  
Superior Tube Co.  
Trent Tube Co., Subs. Crucible Steel Co. of America  
Union Steel Corp.  
Van Huffel Tube Corp.  
Wall Tube & Metal Products Co.

PRODUCES WELDED STAINLESS STEEL TUBE  
PRODUCES WELDED CARBON STEEL TUBE

Much of the weight of cutting building costs can be borne by designing structural support of welded steel tubing. Recent developments resulting in larger sizes and heavier wall thicknesses open many opportunities: you get the efficiency of a thin-walled, hollow section with trimness of line that integrates well with other elements. No need for additional trim or finish unless you want it. Tubing can be formed to any shape—and it lends itself to pre-fabrication and rapid on-site assembly.

The practicality of utilizing the light-weight-to-high-strength ratio of welded steel tubing has been proved by recent experience—in modern office buildings, schools, commercial buildings—even homes. Best current example: supporting curtain walls. Many of the quality tube producers listed here can supply information, or write Department AR-4, Welded Steel Tube Institute, Inc., Hanna Building, Cleveland, Ohio.

### WELDED STEEL TUBE INSTITUTE, INC.



WHEN THE INVITING WARMTH OF CALIFORNIA REDWOOD is made an integral part of the architect's design, buildings such as hospitals and schools have a charming naturalness rather than a forbidding "institutional look". Budget-conscious building committees also look with favor upon CRA Certified Kiln Dried redwood's well justified reputation for durability and easy, economical maintenance. If you do not have an up-dated copy of "The Architect's Redwood File", write Department A-8 on your business letterhead.

Architects, Builders & Associates



CRIPPLED CHILDREN'S HOSPITAL

CRA

*All the wonderful warmth of wood is best expressed in redwood.*

CALIFORNIA REDWOOD ASSOCIATION • 576 SACRAMENTO STREET • SAN FRANCISCO  
CRA TRADEMARKED CERTIFIED KILN DRIED REDWOOD



## PROVEN TREMCO 1-PART 100% LIQUID POLYMER SEALANT

### TREMCO MONO-LASTO-MERIC®, 1-PART 100% LIQUID POLYMER, ACRYLIC BASE SEALANT . . . .

factory mixed, ready for use in cartridge or bulk, assures absolute weathertightness for controlled joints, expansion joints and conventional caulking joints. It has a basic superiority over conventional sealants which require the use of ingredients that will migrate or oxidize in time, thus lowering sealant life and efficiency. Mono-Lasto-Meric is formulated with Tremco developed and Tremco manufactured pure 100% liquid polymer. The desired requirements of exceptional adhesion and enduring elasticity are *inherent* and *permanent* parts of the basic polymer. Absolutely non-staining on masonry surfaces.

For your next bonding, sealing or caulking assignment consider Mono-Lasto-Meric. A product data sheet designed for specifying authorities is available from your Tremco Representative or write: The Tremco Manufacturing Company, Cleveland 4, Ohio, or The Tremco Manufacturing Company (Canada) Limited, Toronto 17, Ontario.



"When you specify a Tremco Product  
... you specify a Tremco Service!"

SEE OUR CATALOG IN SWEET'S

**TREMCO**

PRODUCTS AND TECHNICAL SERVICES FOR  
BUILDING MAINTENANCE & CONSTRUCTION

### The Record Reports

*continued from page 110*

ing of a building, and his belief that eventually architect and engineer would be merged in a common profession.

Mr. Candela stated that he did not believe in the equal collaboration of the architect and the engineer: "A single person must be in control. Creation is a highly individual process." Science, he said, is based on the analytic process; art, a higher state, is based on the use of facts learned in the analytic process.

One of the questions from the audience was, "Where does shell design go from here?" To which Candela replied, "I don't know really. I am so busy, I never think really of the next development. I only work by pressure from the outside. If I have nothing to do, I do nothing, you see?"

### Architect-Engineer Education

Another question from the audience was, "How do you think architectural and engineering education can be improved?" "By a greater disposition on the part of the faculty to participate in actual practice," said Mr. Parkin. He continued, "Frequently students are misled as to the nature of what an architect does after graduation. They expect their names to be in lights. The fact that his performance will be largely anonymous ought to be conveyed to the student early." He added that the prima donna attitude of architects coming out of school is quite different from that of the engineer.

Mr. Candela answered that the role of the university in the world is not that of a factory to produce technicians, but to develop the more complete man. "I am against too much emphasis on the practical side of education," he said. Theoretical, not practical knowledge is the important thing.

Mr. Parkin countered by saying he did not mean that liberal arts should not come first, that education should ignore the humanities, or that technicians should be the result of education.

Dean Colbert stated that we must find a way to have inter-disciplinary exchange, architects must learn from other disciplines, and we need "long-term studies in depth." He said, "We want prima donnas, stars!"

*Telefax* **WESTERN UNION** *Telefax* ↑

ATTENTION: J. R. WERTZ, MGR—VON DUPRIN

6 OCTOBER 1961

YOUR CONCEALED VERTICAL ROD DEVICE AND SINGLE POINT 3/4 THROW LATCH HAS SUCCESSFULLY MET UNDERWRITERS LABORATORIES REQUIREMENTS FOR FIRE AND PANIC IN OPENINGS UP TO 8' WIDE X 7' HIGH. LISTING REPORT WILL FOLLOW. HARDWARE OF THE SAME DESIGN AS TESTED IS ELIGIBLE TO BEAR LABORATORIES LABEL AND CONSTRUCTION "INSPECTED FIRE EXIT HARDWARE." FIRE DOORS EMPLOYING THIS HARDWARE WHICH SATISFY THE CONDITIONS OF FIRE AND PANIC ARE ELIGIBLE TO BEAR THE MARKING "FIRE DOOR EQUIPPED WITH FIRE EXIT HARDWARE," IN COMBINATION WITH THE LABORATORIES 1-1/2 HR. B. 3/4 HR. C. 1-1/2 HR. D OR 3/4 HR. E FIRE DOOR LABEL.

R. W. MALCOMSON, PROJECT ENGINEER  
FIRE PROTECTION DEPT.  
UNDERWRITERS LABORATORIES, INC.

*This fire exit hardware may be used with several existing Von Duprin crossbar assembly designs. Detailed catalog information will soon be available. Just write, wire or call to reserve your copy as soon as the Bulletin is off the press.*



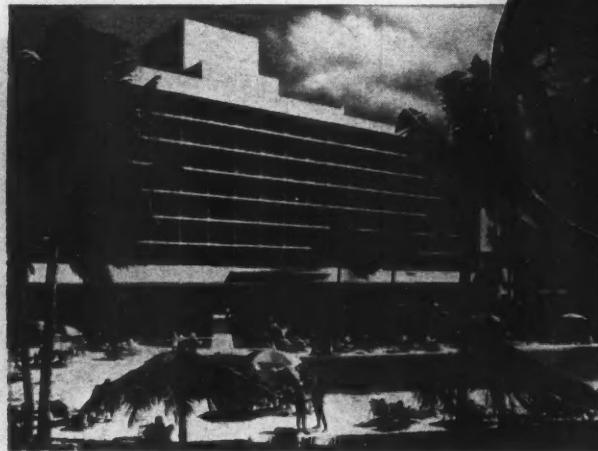
**Von Duprin.**

**VON DUPRIN DIVISION  
VONNEGUT HARDWARE CO.  
402 W. Maryland • MEIrose 2-2321  
Indianapolis 25, Indiana**



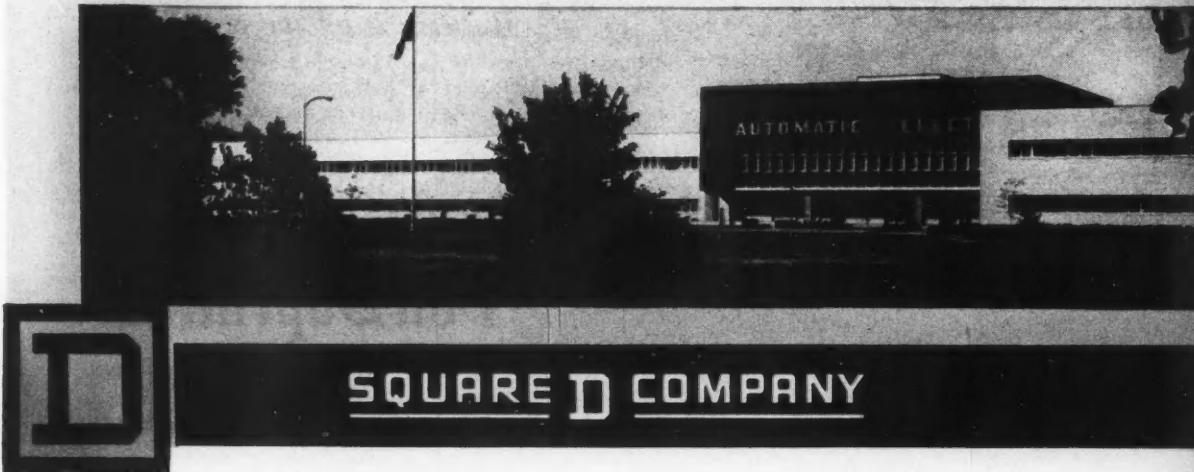
**COBO HALL**, world's largest, occupies 16 acres of Detroit's civic center. It provides 400,000 square feet of exhibit area. Its 10,000 KVA of power is distributed and controlled by *Square D* equipment which includes 11 substations (one of them is shown at right), 37 control centers, 28 switchboards, 550 panelboards, 19,000 feet of lay-in duct.

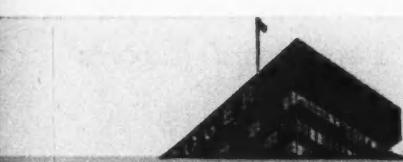
**Square D--wherever**



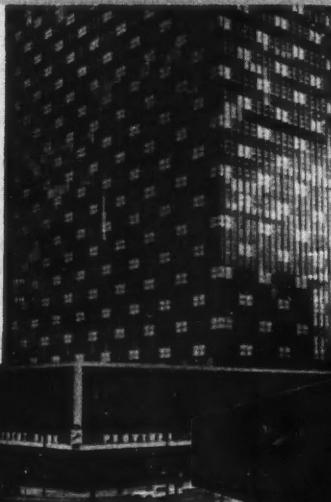
**EL SAN JUAN INTERCONTINENTAL**

One of the Caribbean's most beautiful resort hotels. *Square D* equipment distributes and controls the electricity throughout this modern structure. **ABOVE**—*Square D* control center centralizes all motor control for air-conditioning lobby, offices, dining rooms, night club and casino. *Square D* feed-in duct brings power from substation.



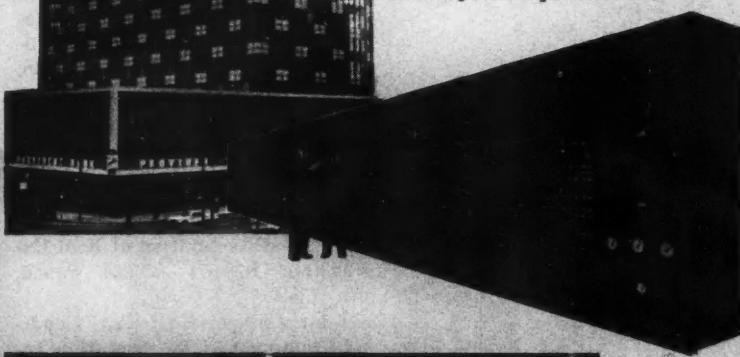


## electricity is distributed and controlled



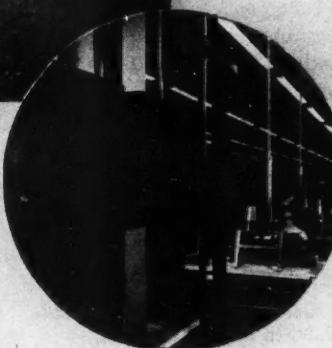
### KROGER BUILDING

Its 29 stories contain more floor space under one roof than any other office building in Cincinnati—over 500,000 square feet. *Square D equipment is on duty throughout this beautiful building.* **BELOW**—a Square D switchboard which handles a multitude of protection, distribution and measuring functions. Panel in foreground visually reports entire system's performance.



### AUTOMATIC ELECTRIC

This 1,520,000 sq. ft. plant, located at Northlake, Illinois, replaces 17 multi-story buildings—an outstanding example of more capacity per square foot through straight-line production design. *Square D equipment plays an important part in many key operations.* **ABOVE**—Square D combination starters in plating department. There are hundreds of them serving dozens of departments. **RIGHT**—Square D lighting panelboards (hundreds of them) are used throughout the plant and offices.



EXECUTIVE OFFICES • PARK RIDGE, ILLINOIS

### *A Complete* LINE

#### OF ELECTRICAL DISTRIBUTION AND CONTROL EQUIPMENT

ADJUSTABLE SPEED DRIVES  
BUSWAYS & WIREWAYS  
CIRCUIT BREAKERS  
CONTROL CENTERS  
CRANE & HOIST CONTROL  
DISTRIBUTION SWITCHBOARDS  
ELECTRIC TRUCK CONTROL  
HIGH VOLTAGE CONTROL  
LAUNDRY CONTROL  
LIFTING MAGNETS  
LIGHTING AND POWER PANELBOARDS  
LIMIT AND FOOT SWITCHES  
MACHINE TOOL CONTROL  
MAGNETIC BRAKES  
METER MOUNTINGS  
MOTOR STARTERS  
PRESS CONTROL  
PRESSURE, FLOAT, & VACUUM SWITCHES  
PUSHBUTTONS  
RELAYS AND CONTACTORS  
RESISTORS  
SAFETY SWITCHES  
SERVICE ENTRANCE EQUIPMENT  
STAGE DIMMERBOARDS  
STATIC CONTROL  
STEEL MILL CONTROL  
SWITCHGEAR & UNIT SUBSTATIONS  
SYNCHRONOUS MOTOR CONTROL  
TERMINAL BLOCKS  
TEXTILE MACHINE CONTROL  
TIMERS  
VOLTAGE TESTERS  
WELDER CONTROL

## *The Record Reports*

### On the Calendar

#### November

- 4-7 National Retail Lumber Dealers Association Eighth Annual Building Materials Exposition—McCormick Place Exhibit Hall, Chicago
- 6-8 Annual convention, Structural Clay Products Institute; theme: Industry Research—Shoreham Hotel, Washington, D.C.
- 6-9 46th edition, National Hotel Exposition—The Coliseum, New York City
- 6-9 1961 conference and Atom Fair atomic exhibit, sponsored by the Atomic Industrial Forum and the American Nuclear Society—Conrad Hilton, Chicago
- 6-10 Annual convention, National Warm Air Heating and Air Conditioning Association—LaSalle Hotel, Chicago
- 11-17 54th annual convention, National Association of Real Estate Boards—Miami Beach, Fla.
- 12-15 Annual meeting, Air Conditioning and Refrigeration Institute—The Homestead, Hot Springs, Va.
- 14-16 Building Research Institute 1961 Fall Conferences—Shoreham Hotel, Washington, D.C.
- 15-18 1961 Joint Convention, Gulf States Regional A.I.A. and Louisiana Architects Association, A.I.A.—Capitol House Hotel, Baton Rouge, La.
- 19-22 Seventh Annual Student Forum, sponsored by the American Institute of Architects and the Association of Student Chapters, A.I.A.—Octagon, A.I.A. headquarters, Washington, D.C.
- 20ff American Society of Mechanical Engineers Winter Annual Meeting; through Dec. 1—Statler Hilton Hotel, New York
- 21ff Exhibition, Stained Glass Windows by Chagall for a synagogue at the new Hadassah-Hebrew University Medical Center near Jerusalem, shown under sponsorship of Hadassah; through Jan. 7, 1962—

*continued on page 256*



## **THIS NEW RLM LABEL ON AN INDUSTRIAL LUMINAIRE IS YOUR TRIPLE CERTIFICATE OF QUALITY.**

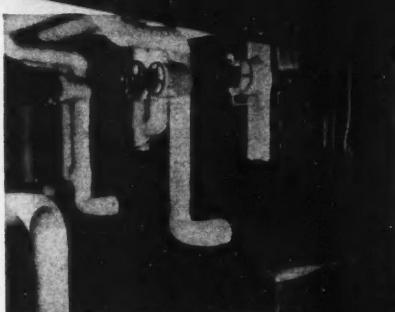
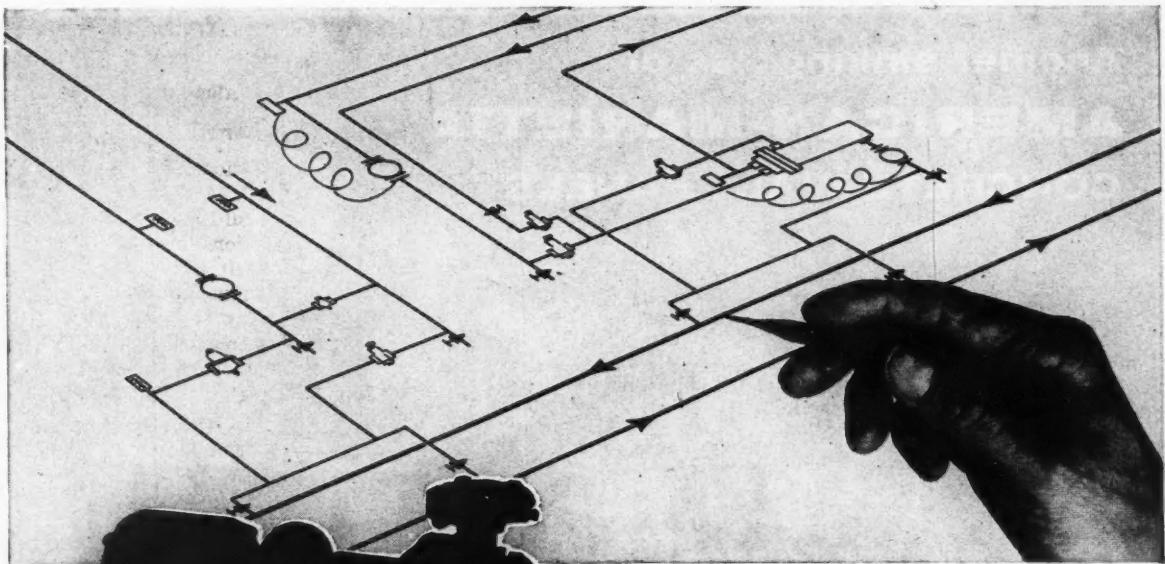
Strict compliance with basic RLM Standard Specifications—for materials, construction and lighting performance—is certified three times:

- Certified by RLM Standards Institute, Inc.
- Certified by the manufacturer whose name is on the label.
- Certified through independent inspection and testing by Electrical Testing Laboratories, Inc.

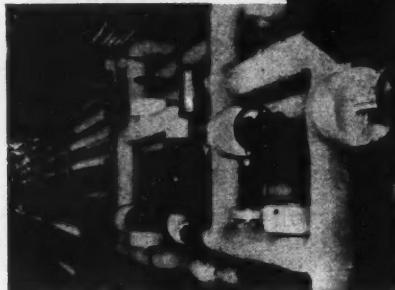
Look for this new RLM label on industrial luminaires. There is no similar certificate of quality in the entire lighting equipment industry.

### **RLM STANDARDS INSTITUTE, INC.**

For your complimentary copy of the new 1961 edition of RLM Standard Specifications, write:  
**RLM STANDARDS INSTITUTE, INC.**  
P.O. Box 754, Meriden, Conn.



*B&G Universal Pumps  
circulating primary mains.*



*B&G Booster Pumps supplying  
individual heating zones.*

**Primary and secondary pumping  
as developed by B&G®  
cuts heating system operating costs**

Where multiple buildings or multiple zones within a building are to be heated with circulated water, *Primary and Secondary Pumping*, as conceived and developed by Bell & Gossett engineers, both reduces pump horsepower and saves fuel by improving heat control.

A typical system consists of a primary main continuously circulated by a B&G Universal Pump, with smaller B&G Booster Pumps drawing on the main to supply separate heating zones. Each zone pump is under individual thermostat control, so that each zone can be supplied with exactly the amount of heat required by its function or exposure.

Write for free booklet which gives detailed information on this more efficient, more economical method of heating with circulated water.



**BELL & GOSSETT  
COMPANY**

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Canadian Licensee: S. A. Armstrong, Ltd.,  
1400 O'Connor Drive, Toronto 16, Ontario

A DIVERSIFIED LINE OF HIGHEST QUALITY PRODUCTS



Booster Pumps



Package Liquid Coolers



Refrigeration Compressors



Marlow Pumps



Heat Exchangers



Oil-less Air Compressors

Another striking use of  
**AMERICAN-MARIETTA**  
**CONCRETE WALL PANELS**



This beautiful, modernistic structure is the Pierre S. du Pont Science Building of Swarthmore College at Swarthmore, Pennsylvania. It was designed by Vincent G. Kling, Architect, F.A.I.A., of Philadelphia.

American-Marietta insulated wall panels add to the charm, as well as serviceability of the design. The relatively large stone used in these panels provides a strong, readily noticeable

texture which complements the earthy or sand color of the panels and provides an extremely clean and attractive appearance.

If you are planning the construction of schools, industrial buildings and warehouses, offices or apartment buildings it will pay you to investigate the many advantages of American-Marietta precast concrete structurals.



**AMERICAN-MARIETTA COMPANY**  
**CONCRETE PRODUCTS DIVISION**

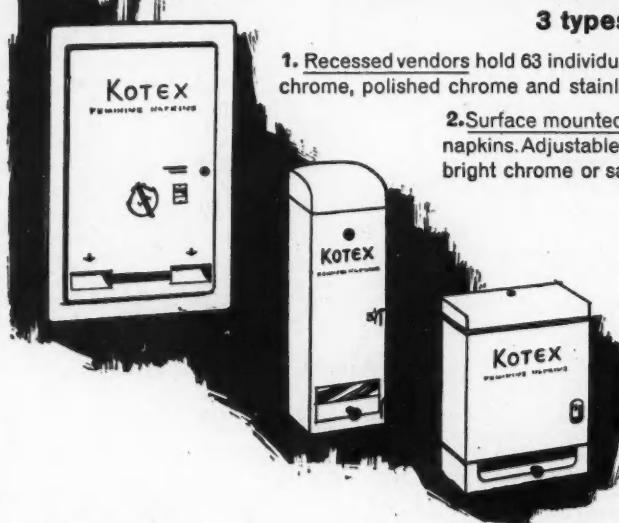
GENERAL OFFICES:

AMERICAN-MARIETTA BUILDING  
101 EAST ONTARIO STREET, CHICAGO 11, ILLINOIS, PHONE: WHITENALL 4-5600



## Vendors for Kotex napkins lower absenteeism —eliminate embarrassment—raise morale

### 3 types to choose from!



**1. Recessed vendors** hold 63 individually wrapped napkins. Available in white enamel, satin chrome, polished chrome and stainless steel. Can also be surface-mounted, if desired.

**2. Surface mounted vendor for boxed Kotex**, holds 15 individually boxed napkins. Adjustable for free, five-cent or ten-cent vending. White enamel, bright chrome or satin chrome finishes.

**3. Surface mounted vendor for envelope Kotex**, dispenses 22 individually packaged napkins. Sturdy, 20-gauge steel cabinet available in white enamel, satin chrome or bright chrome. Operates as nickel, dime or free vendor.

The great convenience of restroom vendors is appreciated by both tenants and employees. And only Kotex offers three types—making it the most complete personal service available for your building. All are easy to install—all have trouble-free, longer-wearing cold-rolled steel coin mechanism.

Vending machines for Kotex belts augment this needed service.

**More women prefer Kotex feminine napkins than all other brands**

KOTEX is a trademark of KIMBERLY-CLARK CORPORATION

Kimberly-Clark Corporation, Department Number AR-111, Neenah, Wisconsin

Please send complete information on vending machine service for Kotex feminine napkins.

Name \_\_\_\_\_ Organization \_\_\_\_\_  
 Title \_\_\_\_\_ Address \_\_\_\_\_  
 City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

# THE CLIENT IS PLEASED



Chase Brass & Copper Co.  
Long Island Warehouse  
Arch./Engr.—Lockwood-Greene Engrs., Inc.  
Contr.—Gilbane Building Co.

Since 1956 this modern warehouse has served the New York-New Jersey market area for Chase, maker of brass mill products for 85 years. The dependability of the Balfour Rolling Steel Doors on the loading docks has contributed to efficient warehouse operation.

**Balfour**  
rolling doors

Catalog in Sweet's or write:  
**WALTER BALFOUR & CO. INC.**

doc-port® doors  
steel service doors  
automatic fire doors  
pygmy® counter doors  
steel grilles

Brooklyn 22, N.Y.

22

## *The Record Reports*

*continued from page 252*

- Museum of Modern Art, New York  
26ff American Society of Mechanical Engineers Winter Annual Meeting; through Dec. 1—Statler Hilton Hotel, New York City  
27-30 39th Annual Meeting, American Institute of Steel Construction—Boca Raton Hotel and Club, Boca Raton, Fla.  
28-30 Building Research Institute 1961 Fall Conferences—Mayflower Hotel, Washington, D.C.

## *December*

- 3-7 18th Annual National Association of Home Builders Convention-Exposition—McCormick Place, Chicago  
5-7 Building Research Institute 1961 Fall Conferences—Shoreham Hotel, Washington, D.C.

## *January*

- 25-27 Annual meeting, Society of Architectural Historians—Boston  
28-31 Semi-annual meeting, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.—Chase Park Plaza Hotel, St. Louis, Mo.

## *Office Notes*

## *Offices Opened*

Harry H. Graef and Martin M. Mintz have opened an office at 711 North Fayette St., Alexandria, Va. under the firm name of Graef-Mintz & Associates, Architects.

Paul Conklin Quigg, Architect, A.I.A., announces the opening of his office at 2060 North 14th St., Arlington 1, Va.

A new architectural office has been opened by Richard W. Snibbe, A.I.A., at 200 East 37th St., New York City

## *New Firms, Firm Changes*

Luther W. Graef, Leonard P. Anhalt and Robert E. Schloemer have formed the following firm: Graef, continued on page 260



**Holds 9,385 times its own weight. Permanently.**

The fastener you see is a Ramset #3601. It weighs a scant 120 grains, red tip and all.

Because we're a conservative lot—and build in safety factor upon safety factor—we rate its designed holding power at 160 pounds, anchored in 3,500 psi concrete. Almost 10,000 times its own weight.

(In a series of controlled tests, our austempered Eye Pin averaged 2,000 pounds holding power in tension. Almost 120,000 times its weight. Hmm. Move over Archimedes. With a big enough fastener, we could hold the world.)

Astonishingly enough, Ramset powder-driven fasteners do their job with

incredible speed. "In place" in less than 30 seconds. For setting an Eye Pin. For fastening steel to concrete or steel, wood to concrete or steel.

For a copy of our informative, 48 page "Fastener Handbook," with specifications and recommended applications, simply drop us a line on your company letterhead.

**Ramset** WINCHESTER-WESTERN DIVISION **Olin**  
301-K Winchester Ave., New Haven 4, Conn.

**570 BROAD STREET BUILDING**  
Newark, New Jersey

A dramatic addition to Newark's Washington Park Area, developed by the century-old Mutual Benefit Life Insurance Company.

**ARCHITECTS & ENGINEERS**

Frank Grad & Sons  
Newark, New Jersey

**LENDING INSTITUTION**  
Mutual Benefit Life Insurance Co.  
Newark, New Jersey

**GENERAL CONTRACTOR**

Wm. L. Blanchard Co.  
Newark, New Jersey

**LEASING & MANAGING AGENT**  
Peter F. Pasberg & Co., Inc.  
Newark, New Jersey

EVERYTHING ABOUT  
THIS NEW  
OFFICE BUILDING  
WILL BE BREATHTAKING  
  
...EXCEPT  
THE ELEVATORS!



## Haughton **DYNAFLITE** Control

will provide fastest floor-to-floor time with complete comfort!

This is the 570 Broad Street Office Building, Newark, New Jersey. Now under construction, its 14 floors will be served by four Haughton Operatorless Elevators with totally new Dynaflite control. With this control, floor-to-floor time can be incredibly fast, because starts and stops are so precisely controlled every time, and are so gentle that passengers scarcely feel any motion at all. Thus Dynaflite combines speed and comfort to provide unmatched efficiency and passenger

well-being . . . and enhance building prestige and rentability. Haughton Dynaflite control is ready to serve your buildings today, thanks to Elevonic\* . . . the new technology in vertical transportation that has created new standards for excellence in elevator performance. Include Dynaflite's distinctive advantages in your building or modernization plans. Ask your Haughton representative for complete details, or write us, without obligation.

### A HAUGHTON 7-PROGRAM SYSTEM

will anticipate in advance the varied traffic conditions encountered in the 570 Broad Street Building. An "electronic brain" will automatically dispatch cars at proper

times, in the proper sequence . . . avoiding the congestion of "rush hours" and "coffee breaks." This type of predetermined service can work wonders in your installation.

\*Haughton's advanced program in elevator systems research and engineering, with specific emphasis on the creative application of electronic devices and instrumentation for betterment of systems design and performance. Reg. in U. S. Pat. Off.

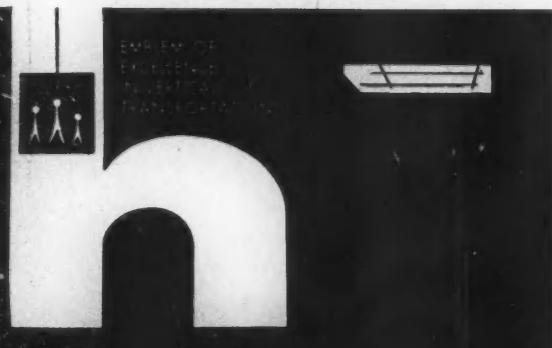
## HAUGHTON ELEVATOR COMPANY

DIVISION OF TOLEDO SCALE CORPORATION

Toledo 9, Ohio

Offices in Principal Cities

PASSENGER AND FREIGHT ELEVATORS • ESCALATORS • DUMBWAITERS





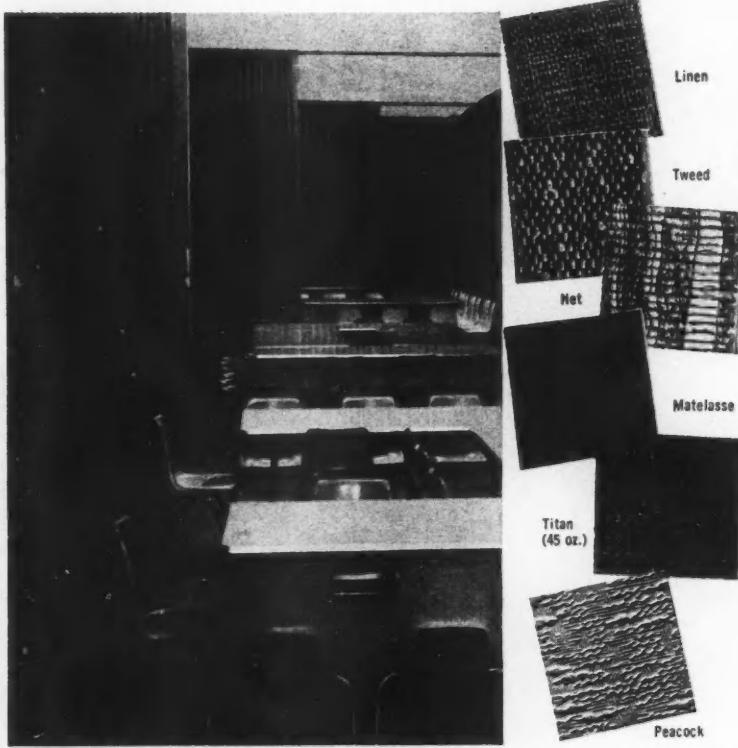
stucco  
for patterns  
unlimited...

*New design, texture and color effects for walls!* Architects have yet to find a more workable and idea-stimulating material than portland cement stucco. No other wall material lends itself to such individualistic treatment. Handle it with a bold sweep . . . or a subtle touch. Sculpture it. Comb it. Or achieve color and texture with an exposed aggregate like the panel featured above. Use it with traditional or contemporary designs. Use it for entire walls . . . or for dramatic accents. White portland cement stucco in fresh and intriguing forms is being used by more and more architects as today's modern material for modern living.



**PORLTAND CEMENT ASSOCIATION**

*... A national organization to improve and  
extend the uses of portland cement and concrete*



# NEW SUPER— Soundguard X-8

## FIRST in SOUND REDUCTION and FIRST in BEAUTY

The new Super-Soundguard Foldoor X-8 provides the greatest sound reduction of any steel frame single folding partition in the 8-1/2" profile class. Average attenuation for 9 frequencies is 35.8 db. Tested to ASTM Std. E90-55 by Geiger and Hamme of Ann Arbor, Michigan.

Beauty is inherent in all Foldoor installations. Decorator fabrics available in a wide selection of colors and textures.



A dramatic new concept in customized grillework for institutions, offices, homes. Sculptured styrene, factory fabricated in a number of complete systems . . . ready to install. Limitless design possibilities — space dividers, screens, door accents, etc. Available in metallic or regular colors. For interiors and exteriors.

Practical and handsome, Foldoor fabrics meet the most rigid fire codes, shrug off wear, stay bright and beautiful for years to come.

See your Foldoor distributor for Super-Soundguard specifications, sound test results, and fabric samples—or mail this coupon.

<b>HOLCOMB &amp; HOKE MFG. CO., INC.</b> 1545 Van Buren Street Indianapolis 7, Indiana Dist. 636		<b>FOLDOR</b> 
Please send complete information on: <input type="checkbox"/> SUPER <input type="checkbox"/> FILIGRILLE <input type="checkbox"/> Have job SOUNDGUARD grillework <input type="checkbox"/> in planning, Specifications <input type="checkbox"/> please call		
NAME _____		
FIRM _____		
ADDRESS _____		
CITY _____	STATE _____	

## The Record Reports

continued from page 256

Anhalt & Schloemer, Consulting Engineers. The address is 6340 West Fond du Lac Ave., Milwaukee 18, Wis.

Gordon L. Schenck has been named a senior associate with the firm of Ballard Todd Associates, architects. New associates of the firm, which is located at 123 E. 77th St., New York, are Robert Cabrera and Paul F. Basile.

A new consulting engineering firm has been formed by Jacob Koton and William J. Donovan. Koton and Donovan, with offices at the Crossroads Plaza, West Hartford, Conn., will specialize in mechanical and electrical engineering in the air conditioning, refrigeration, heating, plumbing and electrical fields.

David John Lepore, formerly design and architectural supervisor for the Sheraton Hotel chain, has joined the staff of John S. Bolles, Architects and Engineers, San Francisco.

Harry E. Cooler, Don B. Fisher, Robert E. Lakin and Wm. C. Schubert, formerly with architectural firms in the Indianapolis, Ind. area, have formed a new firm called Architects Coordinate. The new organization is located at 4845 College Ave., Indianapolis.

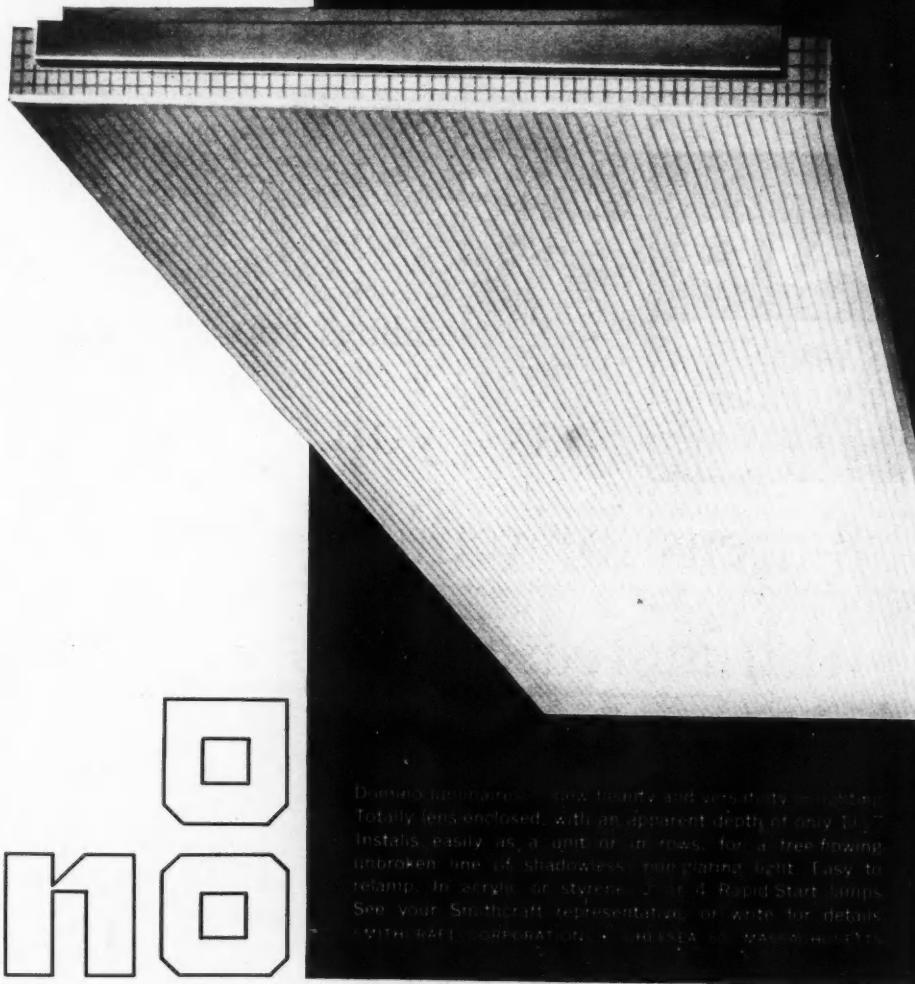
Ray Stuermer has been appointed vice president in charge of the design department with Childs & Smith, Inc., 20 North Wacker Drive, Chicago 6.

Charles Bacon Rowley and Associates, Inc. and Ernst Payer announce the change of corporate name to Rowley, Payer, Huffman and Leithold, Inc., Architects and Engineers. Members are Charles Bacon Rowley, Ernst Payer, Emerson I. Huffman and Joseph A. Leithold. New offices are located at 1420 Keith Building, Cleveland 15, Ohio.

Associate professor Howard Barnstone, of the design department in the College of Architecture, University of Houston, has separated his private practice from the former firm of Bolton & Barnstone, Architects. The new office of Howard Barnstone and Partners is at 630 Esperson Bldg., Houston 2.

The architectural firms of Leon Brown and Thomas W. D. Wright, Grosvenor Chapman and Joseph Miller have been absorbed by the

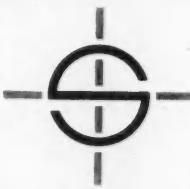
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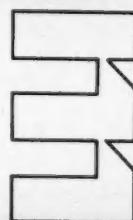
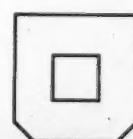
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**domino!**



**Smithcraft**



Domino lampaires... new beauty and versatility... better...  
Totally lens-enclosed, with an apparent depth of only 1 1/2".  
Installs easily, as a unit or in rows, for a free flowing  
unbroken line of shadowless, non-glaring light. Easy to  
relamp, in acrylic or styrene. 2 or 4 Rapid Start lamps.  
See your Smithcraft representative, or write for details.

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\*

in the buildings you are designing,  
have you studied these

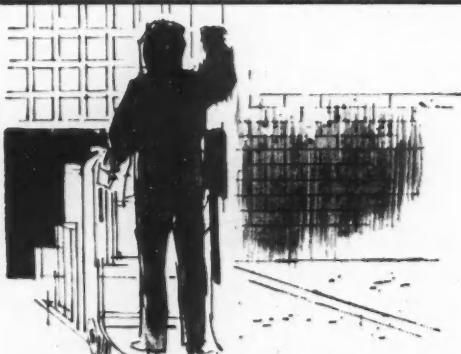
## 8 areas for reducing operating cost with increased door efficiency?

Plant doors will affect operating profit. They can make money or lose money for your client. They will substantially affect flow of material, productivity of people and machines, environmental control, and maintenance.

Barber-Colman's AID\* Plan helps you provide your client a properly planned, highly effi-

cient door system requiring minimum maintenance . . . helps keep production on the move, adds an extra measure of quality control to his operation.

An analysis of these 8 areas will help you accurately identify product performance requirements . . . provide maximum operating efficiency and value for your clients.



1

**MATERIAL HANDLING** comes to a sudden stop when a "most important" door breaks down. Productivity of handling equipment and operators is a complete loss during this time. Let Barber-Colman show you how to anticipate and prevent with guaranteed 100,000 cycle springs.



2

**PRODUCTION** slows down or stops when materials are delayed due to door breakdown. Cost of lost production plus downtime of machine and operator can be high. Let your Barber-Colman door specialist help analyze and eliminate this.

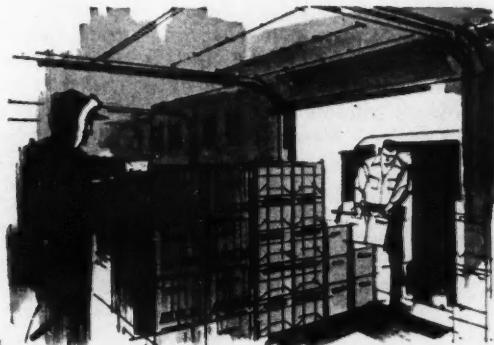


**Analyze Inefficient Doors:** Are your clients' plant door systems struggling to meet today's production requirements, yet designed to match conditions of ten or 15 years ago? In remodeling or new construction design, make certain that plant doors are properly integrated with building function and production flow. Your Barber-Colman door specialist can help you analyze performance requirements with the Barber-Colman DOOR SYSTEM ANALYSIS—a detailed, 41-point check list. It will help you prevent door inefficiencies, reasons for excessive door repair and maintenance, bottlenecks in material handling, and possible unnecessary loss of productive manpower. *Anticipate and prevent unnecessary plant-operating costs with Barber-Colman's AID\* Plan. Call today (see yellow or white pages) or write us direct.*





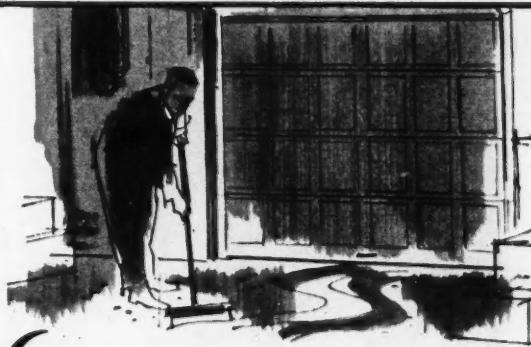
**3** **"WALKING LABOR"** costs mount up fast. When a man leaves a production job or material-handling unit simply to open/close doors your client has another indirect cost. Barber-Colman strategically located switch controls and job-engineered electric operators provide the solution.



**4** **HEATED OR COOLED AIR** is expensive to make, important to save. Do doors seal tightly, or are profits leaking out through "holes" you don't see? Seal the "holes" with Barber-Colman Cam Action doors and specially insulated sections.



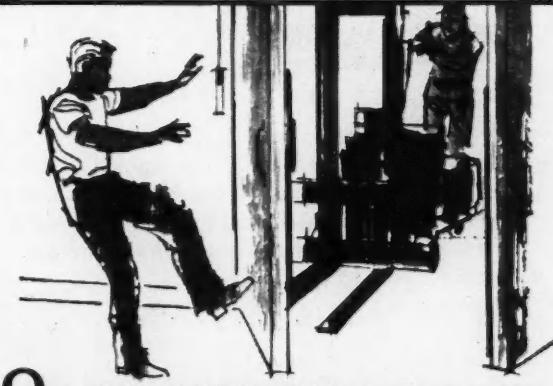
**5** **DUST-FREE, DEHUMIDIFIED OR OTHER SPECIAL CONDITIONED AIR** may be necessary to maintain accurate quality control for a product. Provide complete sealing protection with Barber-Colman Cam Action doors.



**6** **MAINTENANCE** costs go down . . . drafts, contaminated air, dirt, dust, grit are sealed out with Barber-Colman controlled operation and tight sealing.



**7** **EMPLOYEE HEALTH, COMFORT** are affected by the efficiency of a plant's doors. Barber-Colman AID® Plan assures employee protection and increased productivity for your client.



**8** **ACCIDENTAL DAMAGE, INJURIES** are caused when doors are inefficiently planned or operated. Anticipate and prevent these dangerous occurrences and unnecessary costs with the Barber-Colman AID® Plan.



**BARBER-COLMAN COMPANY, DEPT. P 111, ROCKFORD, ILLINOIS**

**OVERdoors**  
*... helping industry boost efficiency*

## The Record Reports

continued from page 260

firm of Brown, Chapman, Miller, Wright, with offices at 1640 Wisconsin Ave., N.W., Washington 7, D.C. This firm represents a partnership of four architects whose objective is to provide complete services in the fields of architecture and urban design for private as well as government clients. In addition to the four partners, there are four project managers—Charles T. Downham, Harold Adler, Judith A. Byrns and Michel Parlier.

Donald W. Reidenbaugh has been made a general partner in the architectural firm of Ross W. Singleton. The firm will continue under the name of Singleton & Reidenbaugh. Offices are located at 466 Coho Bldg., Lancaster, Pa.

### New Addresses

Aisner and Atwood, Architects, 920 Park Square Bldg., 31 St. James Ave., Boston 16.

Russell E. Collins, A.I.A., Architect, 2403 Moray Ave., San Pedro, Calif.

Ilmars Lagzdins, Consulting Civil Engineer, 212 J. St., Eureka, Calif.

McIntosh & Moeller, Architects and Engineers, 719 Main St. West, Hamilton, Ont.

Howard R. Meyer, F.A.I.A., Architect, 2727 Oak Lawn Ave., Dallas 19.

Edward H. Noakes & Associates, Architects, 7805 Old Georgetown Rd., Bethesda 14, Md.

Desmond J. Parker, Architect, Suite 102, Mainland Bldg., 1378 Fifth Ave., Prince George, British Columbia.



take  
a  
last  
look!



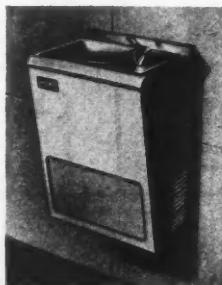
this is the back of  
Haws wall-hung Electric  
Water Cooler: HWT-13

When this compact Haws Water Cooler is mounted, it'll hug the wall—off the floor!—and you'll never see this view again. As craftsmen, though, we're proud of the quiet cooling unit, the heavy-gauge steel panels, the leak-preventing silver soldered fittings, and (above all) the built-to-last craftsmanship. It's a sturdy, compact cooler with all plumbing and electrical connections concealed. Efficient!

*And let's face it.....*

The slim-design cabinet, finished in hammertone grey enamel and crowned with gleaming, contoured stainless steel, makes this cooler a beauty. A practical beauty with enough pre-cooled water to serve 155 persons an hour. And we have money-saving low capacity models, too!

*Write for detailed specs! Ask for your copy of HAWS complete catalog and see our data in Sweet's File.*



Since 1909

**HAWS**

WATER COOLERS

Products of HAWS DRINKING FAUCET COMPANY  
1441 Fourth Street, Berkeley 10, California  
Export Dept.: 19 Columbus Ave., San Francisco 11, California

Full-time Faculty at  
Cooper Union Expands

Appointments to the full-time staff at Cooper Union School of Art and Architecture which began this fall were: Bernard Spring, assistant professor of mechanical and electrical equipment for buildings; Richard Bender, assistant professor of structural design; Norval White, assistant professor of architectural design.

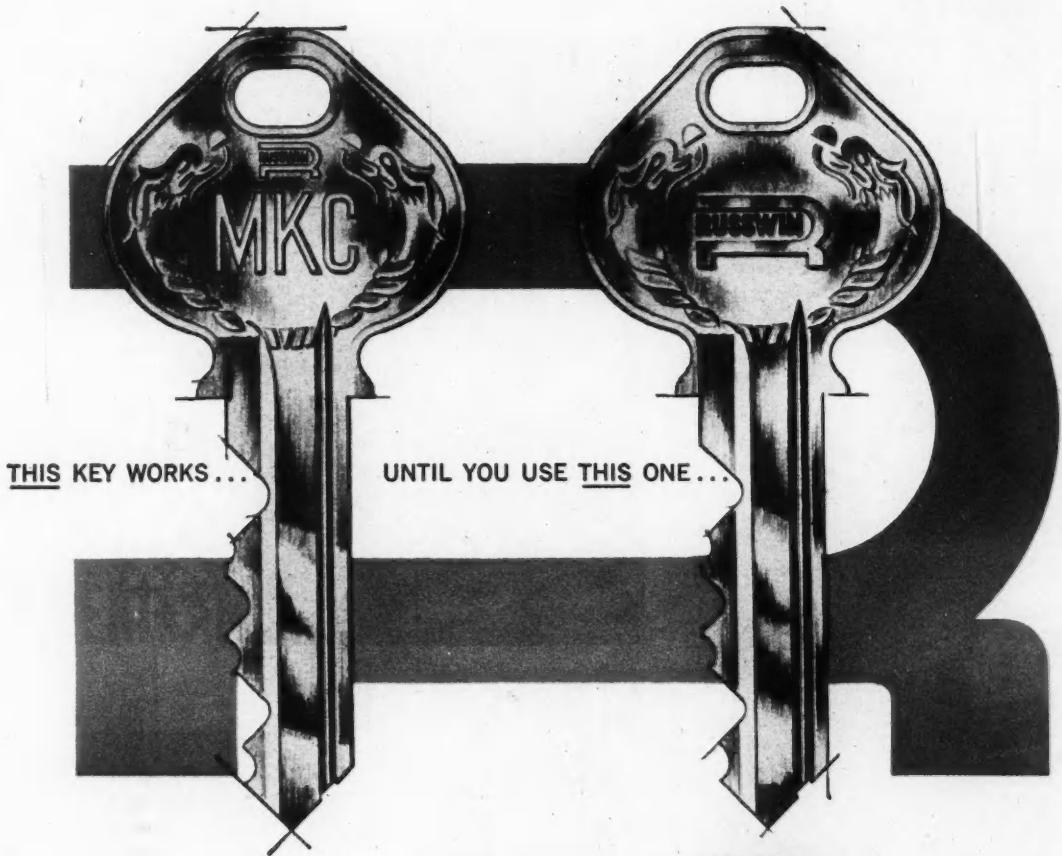
The expansion of the faculty began in 1960 with the appointment of Nicholas Marsicano, assistant professor in painting.

These appointments have been added to Cooper Union's full-time faculty which consists of: Dana Vaughan, Dean of the School of Art and Architecture; Raymond B. Dowden, Head of the Department of Art; Esmond Shaw, Head of the Department of Architecture; and Matthew Wysocki, Supervisor of the evening session.

Cooper Union's full-time faculty expansion is only one of several long-time goals whose realization began in the Centennial year, 1959-1960. At the same time a new five-year curriculum in the day session of the Department of Architecture was established and a new four-year curriculum in the day session of the Department of Art. As a result, the first Bachelor of Architecture degrees will be awarded in 1964; the first Bachelor of Fine Arts degrees in 1963.

Another aim attained has been the completion of the new Engineering Building, the first major addition to the Cooper Union plant since 1912. (See Buildings in the News, p. 15).

*continued on page 268*



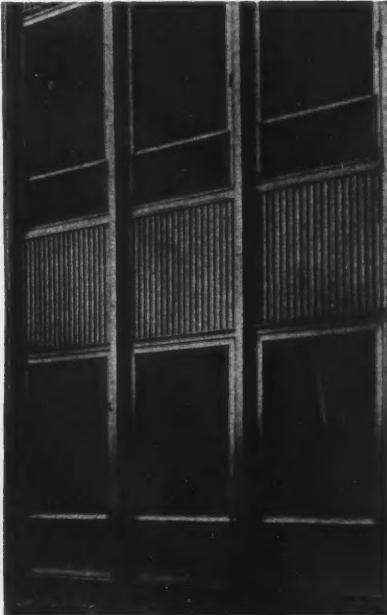
the russwin "P"  
...what it means in  
building security

One set of keys operates locks during building construction. The other set (the owner's keys) cancels out the first set after work is completed. No lock cylinders or pins to change. Russwin's unique Master Construction Key\* System makes security simple... fast... completely practical for *any* building. Look to Russwin... for the finest in doorware... for the services of a specialist, your Russwin distributor. Russell & Erwin Division, The American Hardware Corporation, New Britain, Connecticut.

\*Pat. appl'd. for



New steels are  
born at  
Armco



For Permanent  
Beauty, Economy,  
and Strength

## STAINLESS STEEL WINDOWS COST LESS AND LOOK BEST OVER THE YEARS



Fantus Outpatient Clinic, Chicago  
ARCHITECTS: Richard W. Prendergast & Associates  
CONTRACTOR: Mayfair Construction Co.  
STAINLESS STEEL WINDOW MFR.: Fleur City Architectural  
Metals Division, Hupp Corporation

These attractive, durable stainless steel windows, used throughout the new Fantus Outpatient Clinic in Chicago, reflect the increasing use of stainless for this primary building product. Stainless steel windows are being specified more and more because standard and custom-designed units can be obtained at costs very close to those made of less durable materials. In addition, the extremely low maintenance expense of this architecturally-proved metal means costs are less on an over-all basis.

Where appearance is vital, help preserve at minimum cost the original beauty of the structures you create by specifying windows and other components in Armco Stainless Steel. Let us send you a copy of "Armco Stainless Steels for Architecture," a design and specification manual that shows how stainless steel can be used most economically. **Armco Division, Armco Steel Corporation, 2541 Curtis Street, Middletown, Ohio.**



Armco Division

the latest in store *design* needs  
the latest in store *lighting*...

**300  
FOOTCANDLE  
and  
55° LOUVERS  
by  
AMERICAN**

**ARCHITECT:** Allen Grossman  
New York, N.Y.

**DESIGNERS:** C. E. Swanson and Associates  
Chicago, Ill.



One of the first 300 Footcandle installations in the country of American's recently-introduced 55° Louvers was in MADIGAN'S smart, new suburban store in Melrose Park, Ill. Maximum store illumination—softly diffused to flatter merchandise, customers, and store decor—was the aim of Madigan's management. The result was *perfect store lighting*.

Only American's exclusive 55° deep-cell styrene louvers could achieve such glare-free brightness while utilizing the full advantage of high-level, 300 candlepower illumination. They may be cut, grooved or sized to meet any requirement and...the cost is low. *Specify modern, sturdy 55° Louvers by American.*

Available in translucent white and a variety of colors, for use in individual fixtures, modular units and large areas. Cell size:  $\frac{5}{64}$ " x  $\frac{5}{64}$ " x  $\frac{1}{2}$ " high.

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Engineers are available in your area to help solve your lighting problems. Or... write direct to us for expert, free consultation and advice.

## The Record Reports

continued from page 264

### Greenewalt To Receive 1962 John Fritz Medal

Crawford H. Greenewalt, president of E. I. du Pont de Nemours & Company, will receive the highest honor of the engineering profession, the John Fritz Medal, on Dec. 5 in New York at the Annual Awards Banquet sponsored by the American Institute of Chemical Engineers.

Mr. Greenewalt is cited "For outstanding contributions . . . through

leadership in research, in the translation of research achievements by way of sound engineering into useful products," and through his "able championship of the American free enterprise system both in the spoken and written word."

Presented not more than once in any year for "scientific or industrial achievement" in any field of pure or applied science, the John Fritz Medal is sponsored jointly by the American Society of Civil Engineers, the

American Institute of Mining, Metallurgical and Petroleum Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, and the American Institute of Chemical Engineers. The United Engineering Trustees, Inc. is custodian of the award.

The award was established in 1902 as a memorial to the great engineer and steelmaker, John Fritz. It has been presented to some of the world's most distinguished engineers and scientists, including Westinghouse, Alexander Graham Bell, Edison, General Goethals, Orville Wright, Marconi, Sperry, Hoover, Pupin and Kettering.

### I.E.S. Lighting Competition Winners Announced

First place in the Annual Applied Lighting Competition of the Illuminating Engineering Society held at the organization's National Technical Conference in St. Louis was won by Elizabeth A. Meehan, Philadelphia, and Carl R. Johnson, Upper Montclair, N.J.

Miss Meehan, with the Philadelphia Electric Company, won first prize in the Residential Lighting Class for her presentation on "Light, Liberty and the Pursuit of Happiness." Mr. Johnson, with the Controlessent Lighting Corp., won first prize in the Commercial and Industrial Lighting Class with his presentation on "Integration of Lighting and Architecture."

Both winners received the Charles H. Goddard Trophy plus \$100 and an award certificate.

Other winners were: *Residential Lighting*—2nd place, May Love Gale, Tennessee Valley Authority, Nashville; 3rd place, Peter R. Darnton, Pacific Gas and Electric Co., Salinas, Calif.; 4th place—tie—Hazel Harbauer, Toledo Edison Co., Toledo, and Grace Schoeni, Portland General Electric Co., Portland, Ore.; *Commercial & Industrial Lighting*—2nd place, Melvin Cohen, A. Epstein & Sons, Inc., Chicago; 3rd place, Fred L. Lantz, Giffels & Rossetti, Inc., Detroit; 4th place, Harold Stead, Arizona Highway Dept., Phoenix.

The second place winners received \$50 and an award certificate; third and fourth place winners, \$25 and \$15 respectively, and a certificate.

more news on page 272



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Here's the economical answer to shelving problems. It's Erecta-Shelf, the versatile steel rod shelving. Erecta-Shelf assembles quickly (a cost factor) and easily to meet almost any height, width or depth requirement. Shelves and uprights are machined to notch rigidly together, without screws or bolts. Erecta-Shelf has been load tested to support as much as 1,000 pounds per shelf! Units fasten back to back, end to end or at right angles to fit any plan . . . meet any storage requirement.

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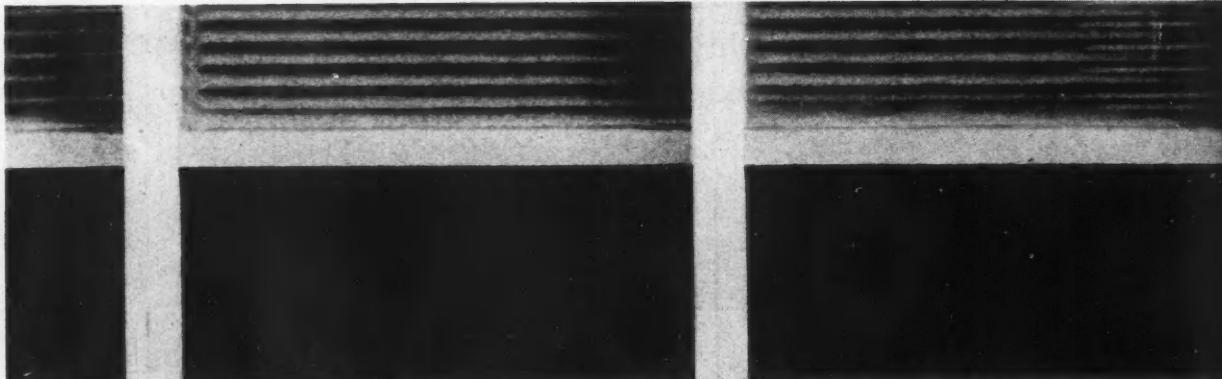
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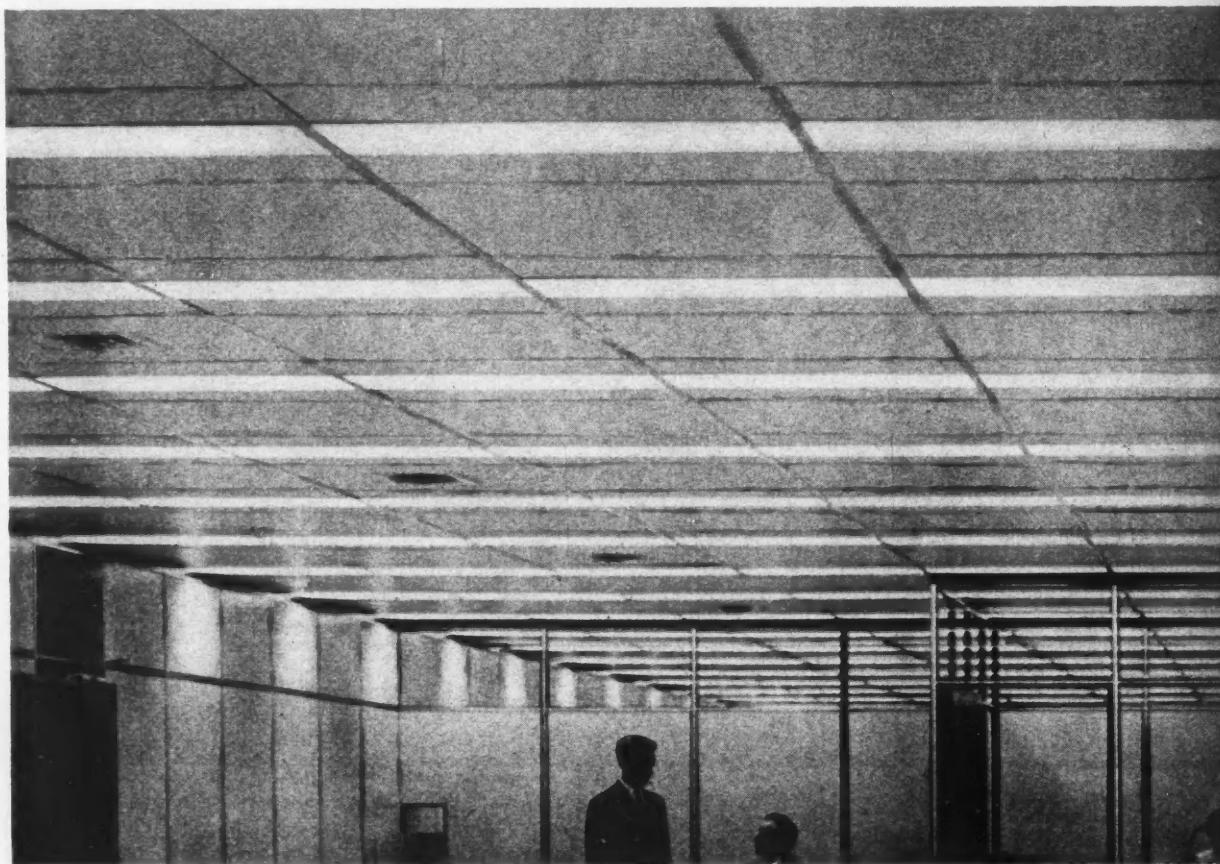


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## SEE HOW THIS FIBERGLAS CEILING FOLLOWS



**A NEW FREEDOM HAS COME TO THE DESIGN OF ACOUSTICAL CEILINGS.** Architects are achieving interesting results—a fresh simplicity with functional economics—through the new size availability of Fiberglas® Noise Control Products. The Equitable Life Building in New York City is an example. Here Skidmore, Owings & Merrill, the architects, wanted the 41-inch mullion module to be carried throughout the interior—



in the lighting, the partition placements, and the acoustical ceiling. Acoustical units were to be  $13\frac{3}{8}'' \times 41''$ , a most unusual size.

Fiberglas Sonofaced Acoustical Tile was chosen because . . .

- It could be obtained in the exact size of  $13\frac{3}{8}'' \times 41''$ ;
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Talk to your Fiberglas representative. Or write for a new catalog on Fiberglas Ceiling Products: Owens-Corning Fiberglas Corporation, Industrial & Commercial Division, 717 Fifth Avenue, New York 22, N.Y.

Columns are 41" x 41". Partition sections are 41" wide. Joints fall on module lines, providing for easy re-location of partitions and lighting.

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FIBERGLAS

\*T-M (Reg. U. S. Pat. Off.) O-C F. Corp.

## The Record Reports

continued from page 268

### New Civil Engineering Scholarships Awarded

Eight area students have been named as first winners in a new program of university scholarships for the study of civil engineering established by the Industry Advancement Program.

Administered by the General Building Contractors Association, Inc., these scholarships are a facet of a pioneering educational program

carried on for the benefit of the public and some 500 firms engaged in commercial, industrial and institutional building in the Philadelphia area who contribute to the Industry Advancement Program. Contributions made are for hours worked by carpenters, laborers, cement masons and millwrights.

The scholarships are open to graduates of public, parochial and private secondary schools. Candidates must

be residents of Bucks, Chester, Delaware, Montgomery or Philadelphia counties. Employes of firms contributing to the Industry Advancement Program also may apply. The scholarships are awarded to recipients who are planning to make a career in the building construction industry and who are accepted for admission by one of the schools involved.

An amount of \$1500 each has been allocated for the 1961-62 school year to the University of Pennsylvania, Villanova University and Pennsylvania State University. An allocation of \$2000 has been made to Drexel Institute of Technology for use in the five-year Co-Op work-study program.

Each of these universities has the option of giving the entire amount of the scholarship money to one student or of splitting it among two or more.

On this basis the following winners have been selected for study at the institution named: *Villanova University*—Ernest M. Allison, Oreland, \$750; Thomas J. Hillegass Jr., Chestnut Hill, \$750; *Drexel Institute of Technology*—Richard E. deFreyre, Havertown, \$1000; Peter Poulsen, Upper Darby, \$1000; *University of Pennsylvania*—Robert K. Huzzard, Royersford, \$1500; *Pennsylvania State University*—Edgar S. Neely Jr., Trevose, \$500; Lee Rosenberger, Souderton, \$500; Howard B. Ratcliffe Jr., Philadelphia, \$500.

## Planning a laundry for a

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### N.Y.U. Architecture Graduates Re-establish Alumni Association

Graduates of the New York University School of Architecture and Allied Arts which closed in 1941 have recently re-established an alumni association.

Officers elected were: J. Stanley Sharp, partner in the firm of Ketchum and Sharp, president; Stanley H. Klein, Stanley H. Klein, Architects, vice president; Arthur W. H. Towne, vice president in the building construction firm of Barlow-Meagher Company, Inc., treasurer; Joseph Roberto, University Architect, New York University, recording secretary; and Carolyn Schor, interior designer, corresponding secretary.

more news on page 276

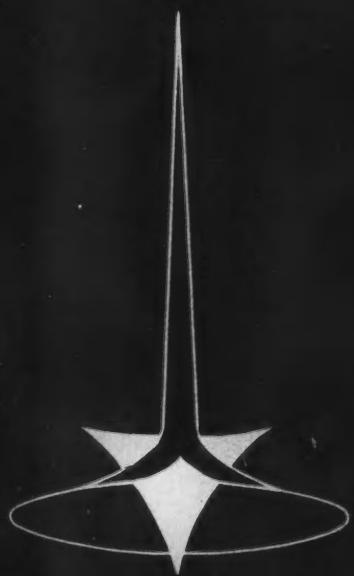
Leviton uses 19 parts and 11 different types of materials to produce this typical switch. Hundreds of special automatic machines are used in fabricating the components. Thousands of skilled operators put the switch through 41 different processes, engineered and controlled every step for maximum accuracy. Only Leviton, with its 3-million sq ft plant facility plus imagination and knowhow, brings you the finest possible switch at the lowest possible price.



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face brightness . . . no hot spots. Lighting quality is definitely Day-Brite.

For those who want the very finest, it's new Day-Brite TIARA . . . the crowning achievement in lighting fixture design. For complete information, contact your Day-Brite representative or write for free 8-page TIARA booklet. Day-Brite Lighting, Inc., 6260 N. Broadway, St. Louis 15, Mo., and Santa Clara, Calif. In Canada: Amalgamated Electric Corp., Ltd., Toronto 6, Ont.

**DAY-BRITE**

NATION'S LARGEST MANUFACTURER OF COMMERCIAL AND INDUSTRIAL LIGHTING EQUIPMENT

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**Design Competition: Mansion for California's Governor**

The State of California has authorized a competition for the design of a Governor's mansion and the Capitol Building and Planning Commission delegated the authority to select the design. William W. Wurster, F.A.I.A., Dean of the College of Environmental Design, University of California, Berkeley, is professional adviser; Daniel Nacht, A.I.A., Sacramento, is assistant to the adviser for

the purpose of conducting the competition.

The following jury has been appointed by the Commission: Pietro Belluschi, F.A.I.A., Dean, School of Architecture and Planning, Massachusetts Institute of Technology, Cambridge, chairman; Gardner Dailey, F.A.I.A., San Francisco; Frank W. Kent, Director, Crocker Art Gallery, Sacramento; Stephen C.

Pepper, Professor Emeritus of Philosophy, University of California; and Lutah Maria Riggs, F.A.I.A., Santa Barbara.

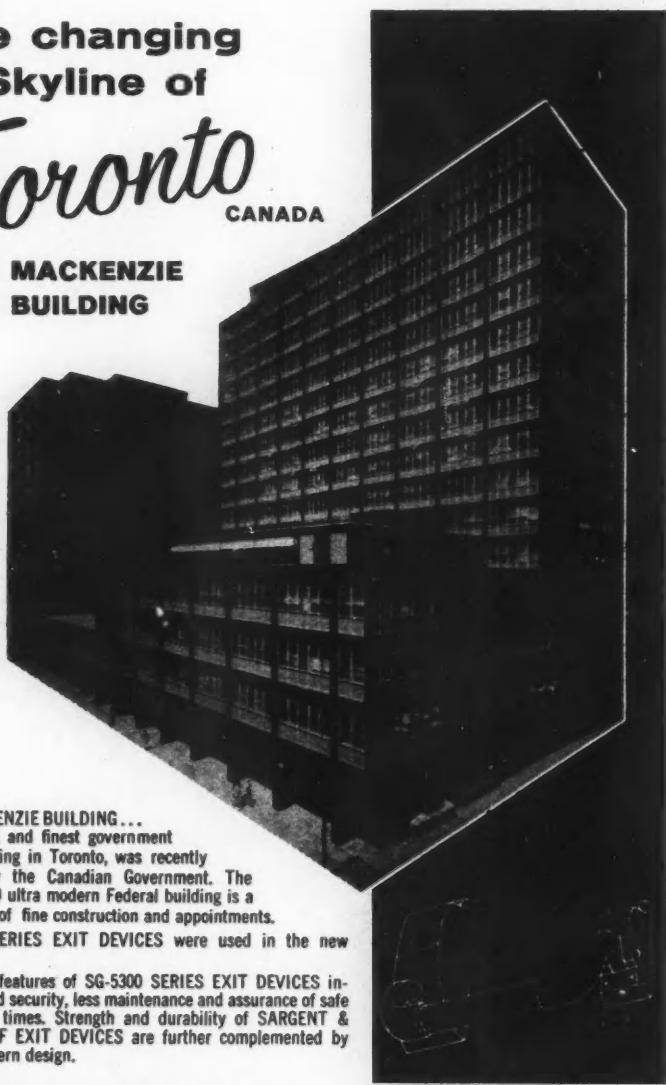
The competition will be conducted in two parts, the first open to all architects licensed by and resident in California. From the designs submitted, the jury will select ten. The architects of these ten designs will participate in the second part of the competition, the jury selecting the winning design. The next three designs will be designated for second, third and fourth awards. There will be no cash awards. The architect of the winning design will be appointed by the Governor to prepare the plans and specifications for the mansion.

Requests for copies of the competition program should be addressed to the Professional Adviser, c/o Capitol Building and Planning Commission, Room 1173, State Capitol, Sacramento 14, Calif.

Applications will be accepted through Nov. 22. Deadline for mailing entries in the first part of the competition is Dec. 6. Judging to select the best ten designs will take place on Dec. 16. Mailing entry deadline for the competition's second part will be Feb. 7. Final judging will occur on Feb. 17.

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CANADA

**the MACKENZIE  
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The MACKENZIE BUILDING... the newest and finest government office building in Toronto, was recently opened by the Canadian Government. The \$12,500,000 ultra modern Federal building is a panorama of fine construction and appointments. SG-5300 SERIES EXIT DEVICES were used in the new building. Important features of SG-5300 SERIES EXIT DEVICES include added security, less maintenance and assurance of safe exit at all times. Strength and durability of SARGENT & GREENLEAF EXIT DEVICES are further complemented by clean, modern design.

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Aikenhead Hardware, Ltd., Toronto, Ontario  
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D. R. Ferguson, A. H. C., Toronto, Ontario

**N.P.S. Grant Aids  
Texas Architecture Research**

A collection of more than 100 architectural drawings and photographs of the Alamo and other historic central and south Texas buildings have been compiled by Walter Eugene George Jr., associate professor of architecture at the University of Texas.

The work was supported by a \$5100 research grant from the National Park Service as part of its national project to obtain records of structures with historical significance or outstanding architectural characteristics.

Professor George, whose special research field is architecture of the Southwest, spent last summer making the collection and compiling historical information on the various sites. Assisting him on the project were two University architecture students, James Emmrich and Jose Jimenez.

*more news on page 280*

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## USG® Expanded Metals

HERE's the material of fresh concepts—steel and aluminum, slit and pulled into patterns that greatly expand your opportunities for design! Not only do USG Expanded Metals add new scope to your ideas with their variety of expressive patterns—but they also are highly functional. The angular cut of some patterns (below) gives them a unique directional property that screens off sun and view, yet lets light and air come through. This makes them handsome and economical in facades on new or old buildings, as concealment fences, as contemporary sunshades.

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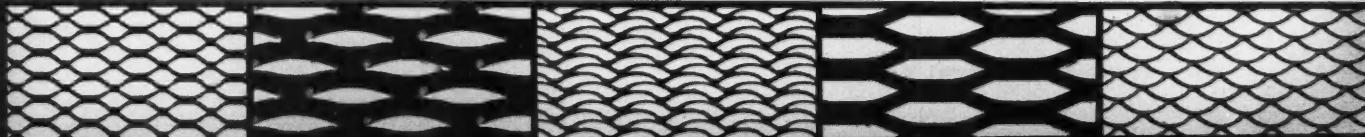
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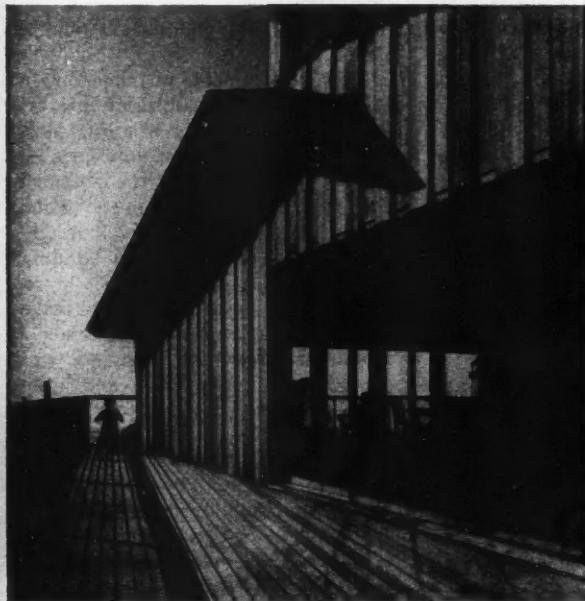




In new churches, wood provides soul-stirring beauty, ideal acoustics, limitless design freedom—all at substantially lower cost. Good reason for the present prevalence of wood in church construction. Floyd Comstock, architect.

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*for freedom of design, look to wood*



The more wood you use in a school, the more good school you build for each tax dollar. Many of America's most successful new school designs have been inspired and made possible by wood construction. Peter Kump, architect.

## The Record Reports

continued from page 276

### Denmark's Royal Academy Studies Island Architecture

Studies made by a Danish team from the Royal Academy of Fine Arts in the Virgin Islands this past summer will provide the basis for recommendations for historic preservation and town planning programs for the Islands.

According to National Park Service Director Conrad L. Wirth, studies of the surviving colonial Danish

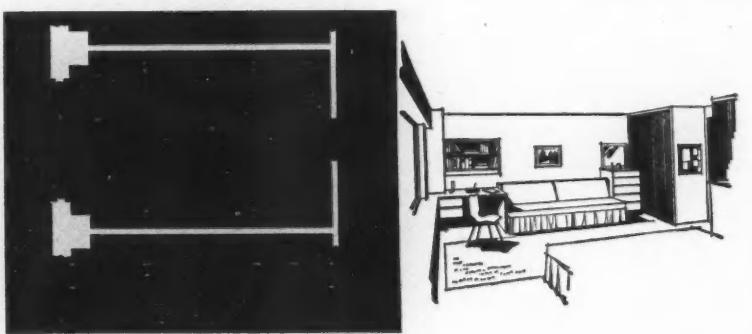
architecture in the Islands were made by a team of 25 students and faculty members of the school of architecture of the Royal Academy. Assisting in the study were two National Park Service employees stationed in the Islands: resident architect Frederik C. Gjessing, who has a Fulbright Visiting Professorship at the Royal Academy, and historian Herbert Olsen, who has a Henrik Kauffmann Fellowship from the American-Scandinavian Foundation.

The studies, which included architecture, town planning, furniture and interior design and contemporary design, were confined to the towns of Charlotte Amalie, St. Thomas, and the towns of Christiansted and Frederiksted and some of the outlying colonial plantations, on St. Croix.

The Government of the Virgin Islands has taken particular interest in the town-planning studies. As a result, \$5000 has been appropriated by the Legislature for the preparation by the Danes of a preservation and urban renewal plan with recommendations for zoning and building codes.

The Danish studies will also make available important materials—measured drawings, sketches and photographs representative of the old Danish economy and way of life in the Islands—for addition to the data collected by the Park Service in connection with its Historic American Buildings Survey Program. Three National Historic Sites containing important examples of Danish architecture are maintained.

The work of the Danish team was professionally sponsored by the Historic American Buildings Survey. Financial aid came from the Jackson Hole Preserve, Inc. and the Danish Ministry of Education, as well as private contributors in Denmark and the Virgin Islands. The Jackson Hole Preserve, Inc. is the nonprofit conservation organization headed by Laurance S. Rockefeller, which donated the lands for the Virgin Islands National Park. American participation in the Royal Academy of Fine Arts program reflects the conservational and educational interests fostered alike by Jackson Hole Preserve, the Danish Institution and the National Park Service.



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Out of over a thousand dormitory furniture plans on which we have worked there has been only one case where two institutions adopted exactly the same student room furniture layouts and designs. This is why Slight-Lowry Contract Furniture Company has no stock plans or furniture units but is constantly called in to consult with the architect and the college administrators and residence halls directors to assist in developing room layouts and designs and specifications for pre-built, pre-finished, built-in and free-standing furniture for dormitory rooms to best suit each individual institution's needs, wishes and budget. The above illustrated plan exactly met the requirements of a leading mid-western university. Let us help to develop one that will completely meet yours. Send for our comprehensive Dormitory Furniture Planning Manual at no cost to college and university officials or architects.



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### First Research Appointment Made at Cornell

Barclay G. Jones, assistant professor of city planning at the University of California since 1957, has received the first research appointment in the Cornell University College of Architecture under the new Dean's Fund in Architecture.

Now associate professor in the department of City Planning, Professor Jones has a Bachelor of Fine Arts

continued on page 284

# for the tower compound curved

*from* MARMET

Maintaining rigid quality control in the factory over the usual type of curtain wall sections . . . to assure easy, tight sealing fit at the job site . . . is demanding enough . . . but when architects Fehr & Granger designed the tower in the Robert Mueller

Municipal Airport to complement the curved forms in other parts of the structure . . . special fabricating and pre-tested assembly of wall components was devised.

Mullions for the tower had to be reformed, after extruding, with compound curves of varying radii in each mullion. Horizontals and operating sash carefully fitted between, had to go into place upon erection with watertight precision fit.

MARMET assigned a project engineer to the task. Special rigs, shown below, were built in a research wing of the factory. The success in execution, now stands in gleaming symmetry at Austin, Texas.

*Robert Mueller Terminal Airport  
Austin, Texas*

*Architects:  
Fehr & Granger  
Austin, Texas*

*Photos by Dewey Mears, Austin*

**Tower: Series 6602 Marmet Curtain Wall, Lower Structure: Series 5142, modified**

From the most tightly budgeted job . . . to designs involving exacting engineering and custom fabricating in curtain wall and other aluminum fenestration . . . you can put your confidence in MARMET. Five different types of basic curtain wall systems with a variety of operating sash, gives you complete flexibility, for successful execution of an unlimited number of design effects. Let your local MARMET representative supply you with full details now.

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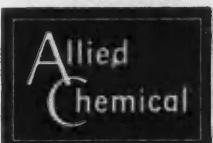
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PROVED TO BE  
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And these 7 benefits will tell you why: 1. **BARRETT** urethane roof insulation has a C value of .13\* (average values of its competitors range from .27 to .40). 2. **BARRETT** urethane is recommended where roof insulation requirements must be the best (such as air conditioned, cold storage and electrically heated buildings). 3. **BARRETT** urethane, sandwiched between two Barrett asphalt coated and impregnated base sheets, provides roofers

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with a walk-on, work-on surface (also, helps the urethane retain its insulating value). 4. The only urethane designed for roof insulation. 5. Does not absorb water. 6. Won't bend, buckle, or melt when mopped with hot pitch or asphalt. 7. Acceptable as a base for Barrett bonded roofs! If interested in free samples and more information, write in today!



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and bachelor of architecture from the University of Pennsylvania and a Master of Regional Planning and Doctor of Philosophy from the University of North Carolina.

The new Dean's Fund in Architecture has been established by special trustee action to develop research in the College of Architecture. It represents an expanding research program in this field at Cornell.

Among short-term appointments at the University is that of Lee F.

Hodgden, assistant professor at the University of Oregon, as associate professor in the department of Design.

**Miami U. Student Wins  
\$1000 Competition Prize**

John G. Shmerykowsky, a University of Miami architectural engineering student, has been awarded a

\$1000 prize in a recent competition sponsored by the Heftler Construction Company for his design of a reasonably-priced home for the average family.

The competition called for the design of a house with three bedrooms, two baths, kitchen, carport and a living-dining area, occupying 1200 sq ft, excluding carport, on a 75 x 100 ft lot. Selling price for the house would be about \$15,000.

Competition supervisor was Professor James E. Branch, chairman of the University's department of architectural engineering, and Professor John E. Sweet. Judges were: John L. Avant, president of the South Florida chapter of the Associated General Contractors of America; Mrs. Betty Jane Bissett, Univ. of Miami assistant professor of home economics; Robert M. Little, Miami architect; Sebastian Pollera, vice president of Heftler; and Miss Jane E. Ward, A.I.D., of Richard Plumer.



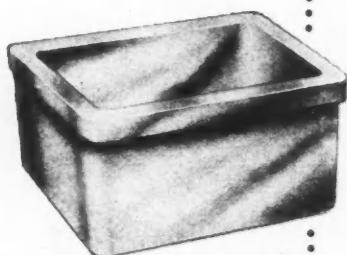
Mr. Shmerykowsky's design emphasizes Florida "indoor-outdoor" living, but retains privacy for the home-owner in a crowded residential area. Exposed concrete block is used as a feature of the decor, and the home utilizes a courtyard that can be economically planted. Windows placed above normal eye level contribute to privacy.

Placing second in the contest was Frank E. Offerle of Miami; and third, Michael R. Botwin of Coral Gables.

**Lincoln Arc Welding Awards  
Made to Undergrad Engineers**

The James F. Lincoln Arc Welding Foundation of Cleveland has granted awards to 53 engineering undergraduate students for their outstanding entries in the Foundation's annual "Engineering Undergraduate Award Program for Arc Welded Designs of Machines or Structures." Awards totaling \$10,000 were made in this de-  
continued on page 288

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PORCELAIN  
LAB SINKS**



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*Lifetime  
Guarantee*

Time-proven "U.S." Chemical Porcelain laboratory sinks are guaranteed *without time limit* to withstand all acids, alkalies, caustics and solvents — hot or cold, weak or strong. With normal routine rinsing, even hydrofluoric acid presents no problem. Thus, there's no need for corrosion charts... for special sinks for special corrosives, with the chances for costly mistakes.

Backed by America's oldest manufacturer of chemical ceramics, "U.S." Chemical Porcelain laboratory sinks are also guaranteed to stand up under all the heat-shock and physical abuse they'll ever meet in ordinary laboratory usage.

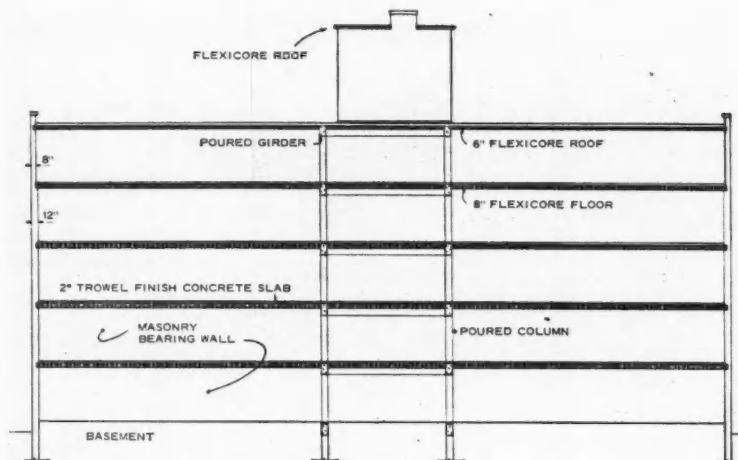
Available in three attractive colors to match any decor — cool "surf green," soft "mist gray" and sparkling white — these non-staining, scratch-resistant one-piece sinks are as easy to clean as a china dish — no scouring or honing is ever required. "U.S." Chemical Porcelain laboratory sinks can be supplied in many types and sizes. For example, in the Fig. 108 model, 46 sizes are available.

For complete details contact your Laboratory Furniture Manufacturer or write direct for free Bulletin L-10.

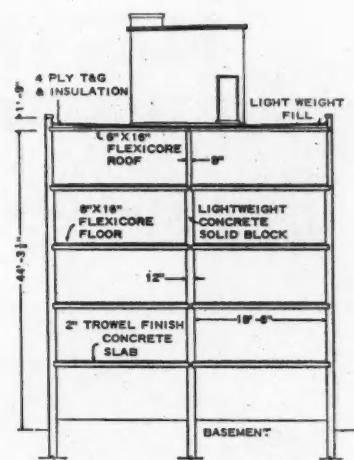
Chemical Ceramics Division

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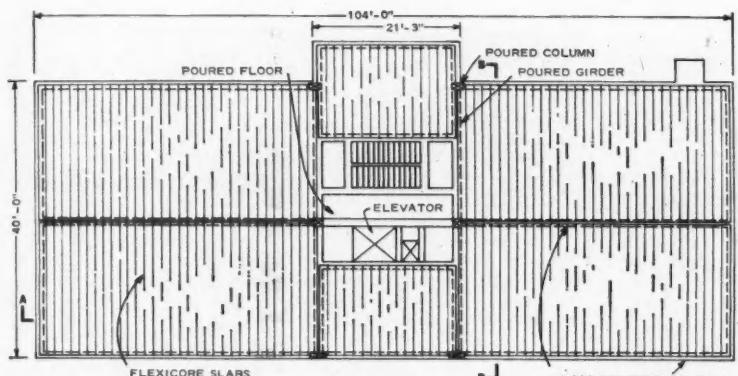
82-H



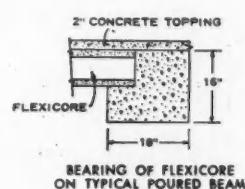
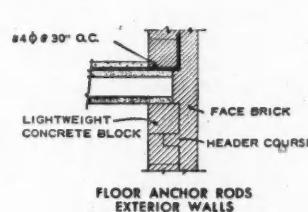
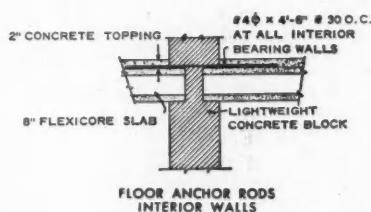
**SECTION AA.** Precast cellular concrete Flexicore decks provide fireproof structural floors and roofs at Fairmay Apartments, Chicago. The five buildings are masonry wall-bearing except for reinforced concrete stairway and elevator core. Design called for 75 psf live load.



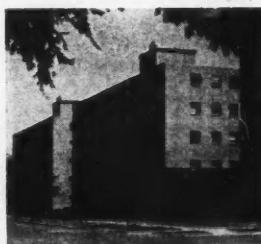
**SECTION BB.** Clear span of 18'-6" between masonry bearing walls permits simplified design and fast construction. Underside of Flexicore deck is exposed for finished ceiling.



**TYPICAL FLOOR FRAMING.** Each 3800-sq. ft. Flexicore deck was placed, leveled and grouted in two days. Available on third day as work deck for erection of walls and frame for next story.



Edward Marks, Architect, Evanston, Illinois



The use of Flexicore precast decks permitted Fairmay Apartments to meet Chicago's strict fire code, and resulted in substantial savings to the owners. High-speed erection permitted earlier occupancy and exposed Flexicore slabs eliminated ceiling plaster.

For more information on this project, ask for Flexicore Facts No. 78. Write The Flexicore Co., Inc., Dayton, Ohio, the Flexicore Manufacturers Association, 297 S. High St., Columbus 15, Ohio or look under "Flexicore" in the white pages of your telephone book.



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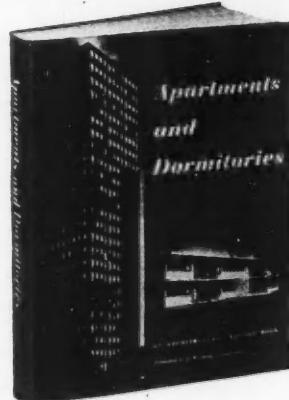
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## The Record Reports

continued from page 284

sign competition established by the Foundation in 1947 to stimulate interest, scientific study and research in the practical design and use of arc welded steel. Winners represent 29 colleges from all over the country.

Entries were in two separate, non-competing divisions: Machinery and Structural. Awards are given for the best papers describing the design of a machine or structure in which the efficient use of welded steel has improved performance or appearance or reduced cost.

First award of \$1500 in the Structural Division was granted James M. O'Neal, architectural engineering student at Rensselaer Polytechnic Institute, for his design study of "An All Welded, Prefabricated Space Frame." The \$750 Second award went to co-authors Perry L. Horacek and Stewart McMinimy, architectural engineering students at Oklahoma State University, for their paper presenting the design of a "Steel Pedestrian Overpass." The \$500 Third award was granted co-authors Donald Olson and Richard A. Soderberg, civil engineering students at Northwestern University, for their paper applying the principles of hipped plate construction to the design of steel highway bridges.

\$250 Fourth awards were granted Jon Ronald Garcia, California State Polytechnic, and Lilvon L. Michael, University of Wyoming, both mechanical engineering students; and Joseph M. Garcia, New York University, and Stanley E. Panko, Washington State University, both civil engineering students.

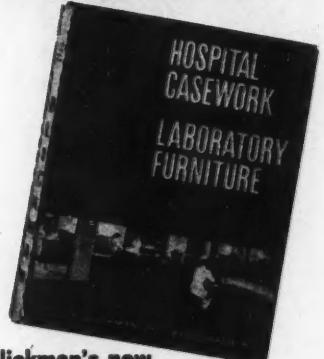
In the Mechanical Division, First award went to Roland W. Gerstenberger, an electrical engineering student at the University of Miami, Fla.; Second award to Alfred E. Barkman, a mechanical engineering student at the University of Wyoming; Third award to Glenn F. Balfanz Jr., a mechanical engineering student at Northwestern University.

### A.S.H.R.A.E. Research Lab Moves to Kansas State U.

One of the world's largest and best equipped environmental research laboratories is being transferred from

continued on page 292

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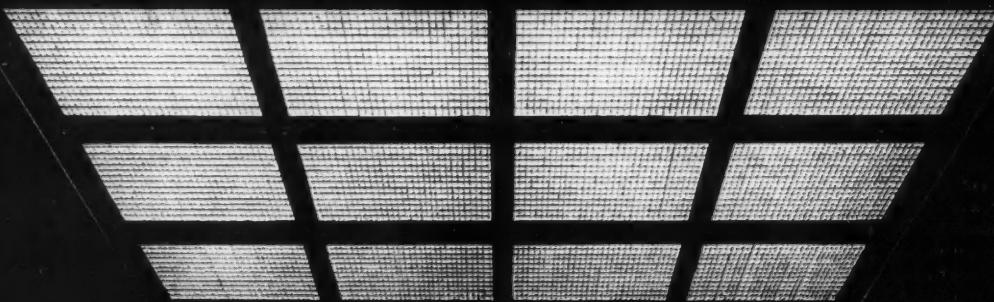
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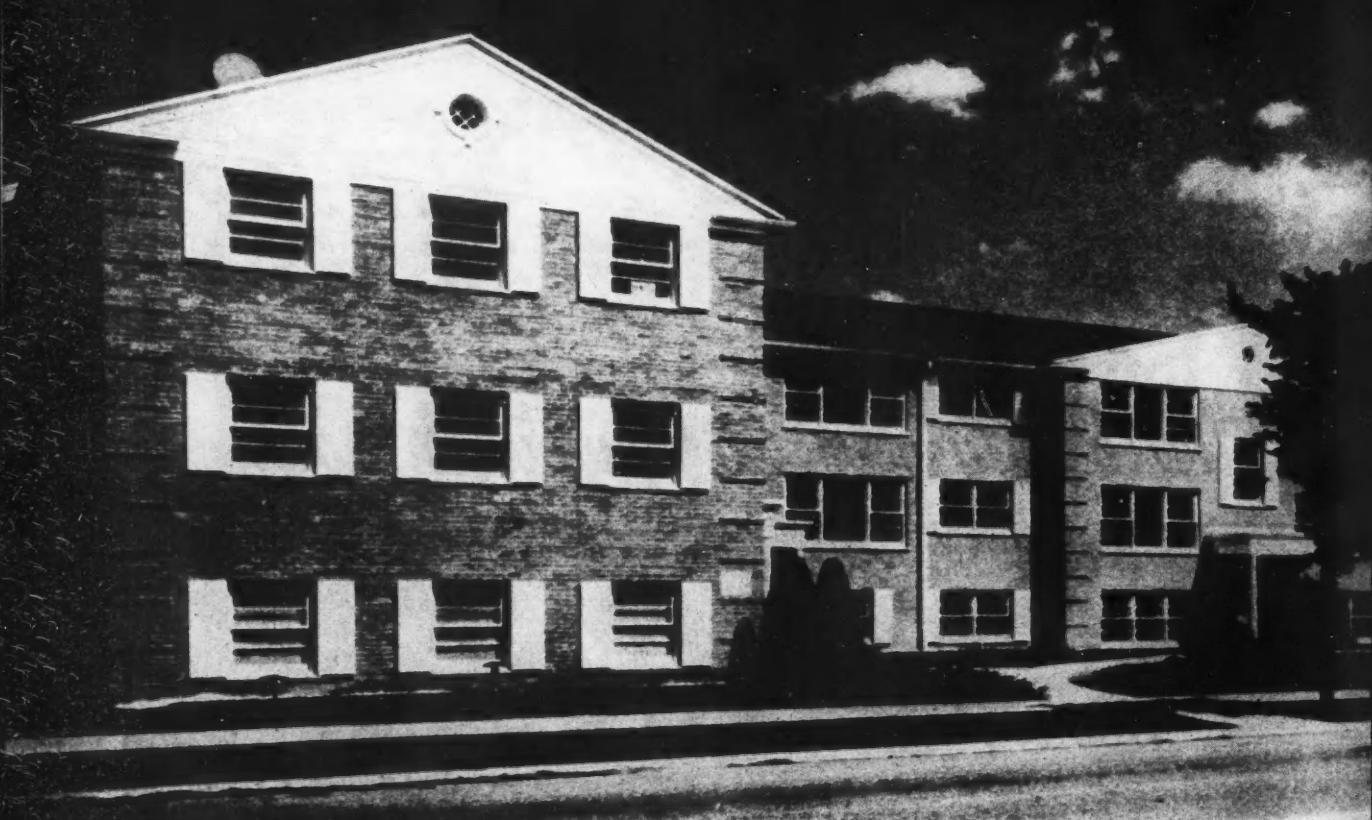
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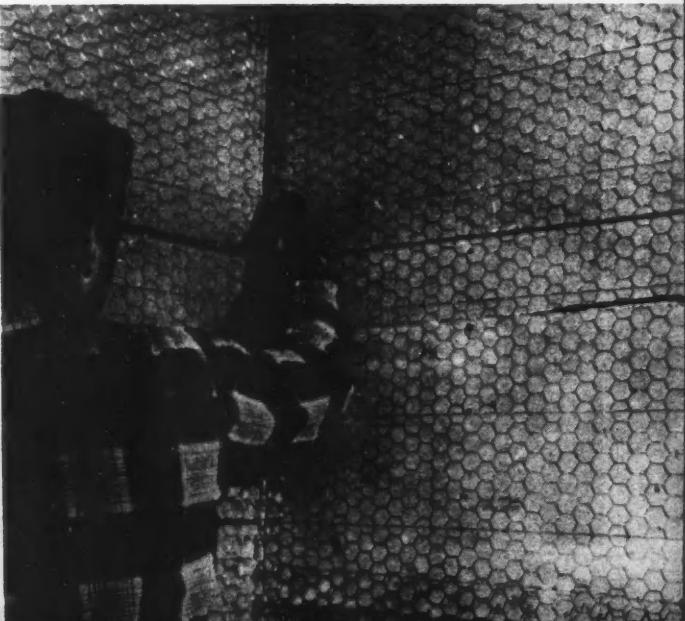
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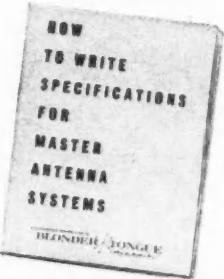
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## *The Record Reports*

*continued from page 288*

the present research facilities of the American Society of Heating, Refrigerating and Air-Conditioning Engineers in Cleveland to Kansas State University, Manhattan, for K-State's Institute for Environmental Research.

The laboratory and its associated equipment, which represent a total investment of approximately \$150,000, will be housed in a \$160,000 building for which the University received an \$80,000 National Institutes of Health grant.

Under the agreement between A.S.H.R.A.E. and the University, K-State will carry on several of the Society's current research projects, with the Society financing this research on a cooperative basis. A number of other outside sources will be contributing substantial support to the research programs planned for the Institute, according to K-State President James A. McCain.

"This type of technical facility should have unusual value in attracting new industry to Kansas," said President McCain. "The selection of Kansas State University for this program is a tribute to the outstanding research contributions in the environmental field by Dr. Ralph Nevins, head of the mechanical engineering department in K-State's School of Engineering and Architecture." Dr. Nevins will direct the new Institute.

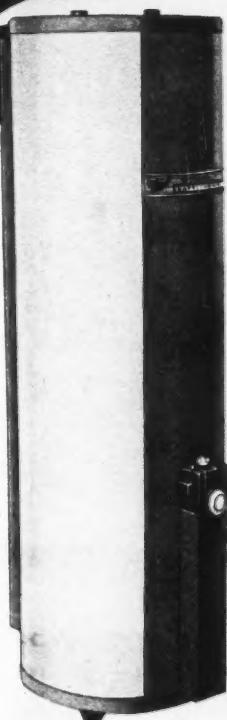
The A.S.H.R.A.E. laboratory is a test room 12 x 24 ft in size. With its associated equipment including heaters, air conditioning units, fans, etc., it is possible to control temperatures on all six wall surfaces, as well as to control the temperature, humidity, movement and cleanliness of the air. The test room will be incorporated into the \$160,000 addition to the engineering lecture hall which is now being planned to house K-State's Institute for Environmental Research.

In addition to the environmental room, Institute facilities will include an air-pollution laboratory, a biological heat-transfer laboratory, an instrument room and office space.

A.S.H.R.A.E. has operated its environmental lab for a number of years, this past year completing a series of experiments to re-evaluate the A.S.H.R.A.E. comfort chart.

*continued on page 300*

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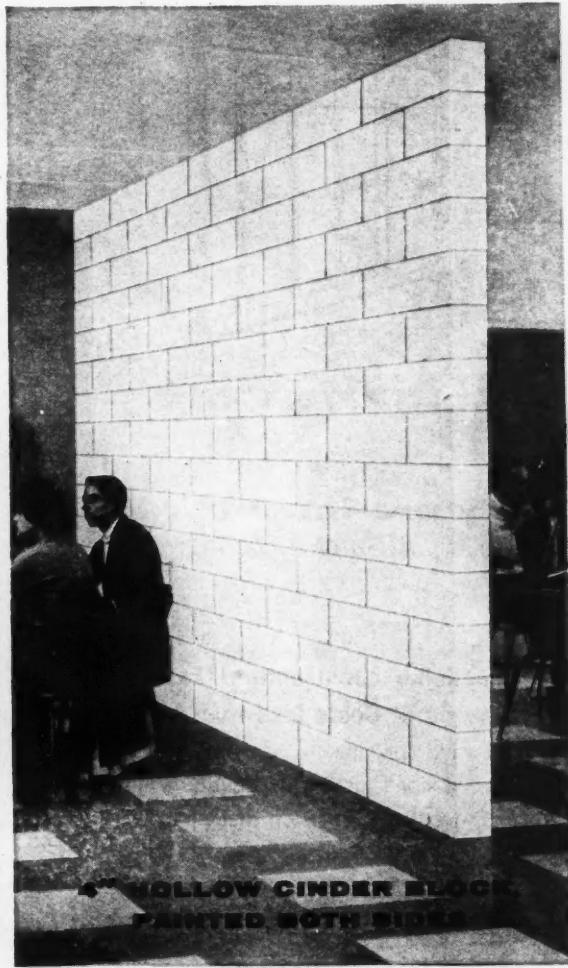


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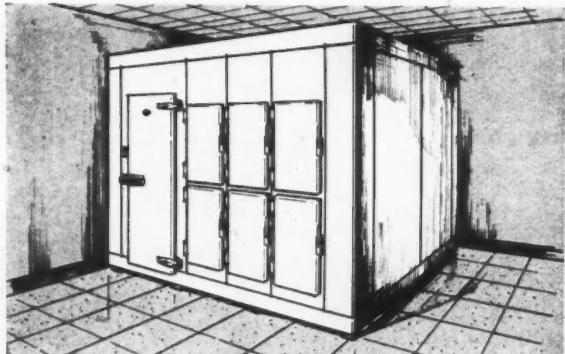
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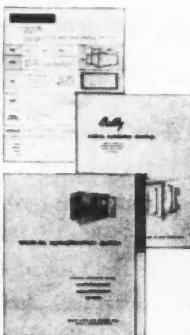
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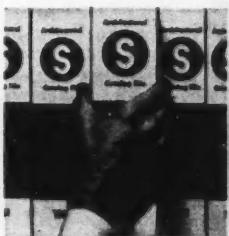
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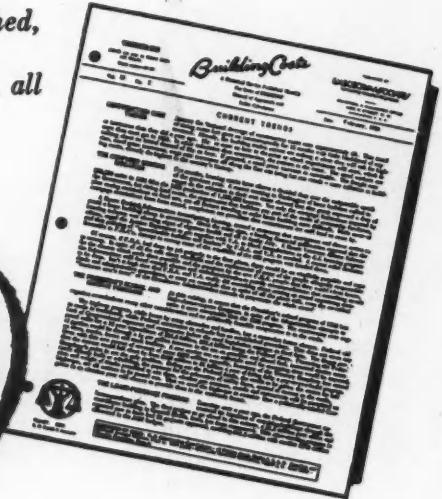
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*Massachusetts Blue Cross-Blue Shield Office Building, Boston, Massachusetts*  
Associated architects: Anderson, Beckwith & Hulme and Paul Rudolph  
General Contractor: George A. Fuller Co



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## *The Record Reports*

*continued from page 292*

based on research done in the 1930's.

Dr. Nevins, an A.S.H.R.A.E. member, and other University researchers have been working on similar problems for several years. A cooperative project between the University's mechanical engineering department and the American Society of Heating and Ventilating Engineers (a predecessor of A.S.H.R.A.E.) was initiated in the late 1940's and since 1950 a study of the effect of floor surface temperatures on comfort has been in progress. As part of this research, the University built a 10-ft cube psychrometric room. Current studies concerned with floor surface temperatures are supported with a National Institutes of Health grant.

K-State's willingness to carry on A.S.H.R.A.E. research work also was a factor. Dr. Nevins has been closely identified with this research program as a member of the organization's research panel on physiological research and human comfort and he is currently chairman of the panel.

Dr. Nevins points out that research into environmental conditions is still in the exploratory stage. The amount of research required, before a clear picture is obtained of the human response to all aspects of the environment, is almost boundless, he says. Among the K-State research projects being contemplated are studies for comfort under various levels of activity, effects of drafts, air pollution and biological heat-transfer engineering problems.

Personnel from psychology, architecture, veterinary medicine, student health and the statistical laboratory are expected to be involved. Within two to three years, Dr. Nevins expects 20 to 30 staff members and graduate students to be working on experimental studies in the Institute.

### **New Service Initiated: Building Operating Manuals**

Robert Reynolds and Associates, Morton Grove, Ill., are offering a new service to architects and engineers as a means of reducing high operation and maintenance costs for the building owner—operating manuals for commercial buildings.

*continued on page 308*

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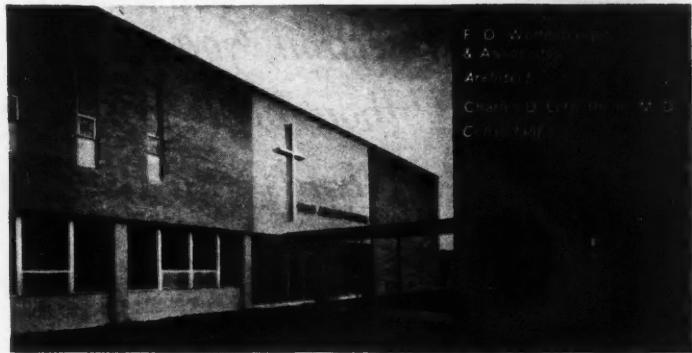
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### **WOOD IN ARCHITECTURE**

by Finn Monies

This handsomely illustrated book surveys the esthetic possibilities inherent in the use of wood in contemporary building, and considers some of the problems involved in its use in exteriors, interiors, and details. Divided into six major sections, this valuable book examines these important areas: Preface (including the idea of the book and an historical look at Danish use of wood), Wood and houses, Interiors, The detail, Textures and finishes, and Wood in large structures. Anyone who plans to work with wood will find this book uniquely practical. (1961)

111 pages, 7 1/4 x 8 1/4, \$6.95

### **MODERN CHURCH ARCHITECTURE**

a guide to the form and spirit of 20th century religious buildings

by Albert Christ-Janer and Mary Mix Foley

Reveals the full range of expression attainable in religious architecture. This superbly illustrated book examines over 40 Catholic and Protestant churches from eight countries. Acknowledged masterpieces, bold experiments, and modest structures using regional materials in a fresh yet traditionally evocative manner are presented.

This highly selective survey is both architecturally and liturgically literate. The magnificent illustrations are enhanced by special articles written by distinguished clergymen, who present the Catholic and Protestant synthesis of architecture and their respective liturgies. (Feb. 1962)

320 pages, 8 1/4 x 11 1/4, \$9.75

### **PUBLIC CONSTRUCTION CONTRACTS AND THE LAW**

by Henry A. Cohen

Examines all the procedures and legal rules relating to the contract—from prequalification to penalties for delay of work. Points of dispute at any stage of administration, and at every level of government, are carefully analyzed. Theoretical discussions are eliminated; all judgments are made in the light of actual cases and the author's 35 years experience in administering improvement contracts.

Divided into nine chapters, this unique guidebook will be of constant service to contractors and subcontractors, government officials, material and equipment suppliers, lawyers, engineers, architects, and surety and casualty companies. (Oct. 1961)

400 pages, 6 x 9, \$12.85

### **CONSTRUCTION ESTIMATES FROM TAKE-OFF TO BID**

by Norman Foster

The first comprehensive book to present the step-by-step procedures to be followed in developing an accurate estimate. Through detailed examples, this practical book teaches the fundamentals of good estimating. It contains valuable tips on how to simplify the take-off without sacrificing accuracy; how to combine items for speedy computation; how to make figures work for you; and how to develop an orderly system of taking-off. A complete take-off and estimate for a \$1,000,000 building is included to enable the reader to see how the author's recommended procedures are applied to an actual project. Also discusses overhead, sub-bids, pricing the estimate, and how the unit prices for a bid are built up. (Nov. 1961)

256 pages, plus 36-page booklet of building plans, 7 1/4 x 10, \$11.75

### **GENERAL EXCAVATION METHODS**

by A. Brinton Carson

Designed specifically for those whose work involves earth and rock excavation, ground water control, and bank stabilization. Examines in detail the procedures and equipment used in all classes of excavation, and indicates the rigs best suited to performing each class of work. Through non-technical language, comprehensive discussions, and thorough step-by-step illustrations, you are shown each procedure and where and why it should be used. Each page of text is faced with a full page of line drawings, giving a graphic picture as well as a verbal explanation of each technique and its practical application. (Nov. 1961)

386 pages, 7 1/4 x 10, \$12.85

### **OFFICE BUILDINGS**

by the editors of Architectural Record

This informative book brings together for the first time in any volume detailed studies of the nation's outstanding office buildings, and shows the significant architectural, structural, and mechanical features of each. This comprehensive study examines over 40 separate locations: company headquarters buildings, architects' offices, office buildings combined with banks, rental properties, engineering office buildings, and many more. Through detailed photographs, structural diagrams, and floor plans, it outlines the individual problems encountered in the design of each building and the methods which were used to solve them. (1961)

256 pages, 8 1/4 x 11 1/4, \$9.75

### **IN PRAISE OF ARCHITECTURE**

by Gio Ponti

A witty and stimulating collection of personal observations about architecture and related matters by a world-famous designer. The insight and sparkle of Ponti's commentaries have had striking effects upon the readers of the original Italian version; they have applauded its brilliance, been astounded by his mental leaps, and stung by his outspokenness. With irreverent remarks, the author has punctured many of the inflated concepts that obscure the proper role of architecture and the architect in today's life. A deep feeling about the serious goals of architecture pervade his work; he speaks with strong emotion about the fundamental values that architecture can and must serve. (1960)

288 pages, 5 1/2 x 7 1/2, \$6.95

### **ARCHITECTURAL RENDERING: the techniques of contemporary presentation**

by Albert O. Halse

A masterful, major treatise explains, in text and choice illustrations, every technique and medium used in architectural rendering today. For the professional renderer, the architect, and the beginner, it offers something new and complete in its field. Every aspect of rendering receives attention here: interiors, exteriors, nature; perspective, lighting, reflections, textures; all of the media in detail; how to buy and use materials, and when; professional tricks of the trade. Introductory chapters contain a history of rendering, a study of color, and other basic information. A special section of professional renderings done in various media also is included. Numerous illustrations, 17 in full color. (1960).

304 pages, 8 1/4 x 11 1/4, \$15.75

## CONSTRUCTION ACCOUNTING AND FINANCIAL MANAGEMENT

by William E. Coombs

The first, and only, complete manual of accounting and financial control for the construction industry, written by a specialist who has served as an attorney, accountant, and executive in the construction business.

Describes and specifically recommends proper accounting and management procedures. Tells you what records to keep, why they must be kept, and several possible ways of keeping them. Relates accounting and record keeping to the size of the firm, type of job, and never loses sight of the fundamental purpose—giving you effective financial control over every operation. Contains 200 tables, charts, and sample forms. (1958)

488 pages, 6 x 9, \$12.85

## ESTIMATING GENERAL CONSTRUCTION COSTS (Second Edition)

by Louis Dallavia

Provides an accurate, foolproof system for estimating all direct production costs in earthwork, reinforced concrete, masonry, structural steel, and carpentry. This unique system can be applied at any time and in any place with equal validity, and can never go out of date. It was developed and perfected by the author during his 22 years as an estimator in heavy construction and building.

Presents an index set of unit costs for typical shift crews, against which you compare local crews, arriving at a productivity percentage. By checking that figure against only three tables, you arrive at shift cost output range, and unit cost for the operation. There is a total of 160 tables and checklists in the book. (1957)

205 pages, 6 x 9, \$8.50

## MOTELS, HOTELS, RESTAURANTS AND BARS

(Second Edition)

by the editors of *Architectural Record*

This revised and expanded book, presents, in one place, an up-to-date, detailed study of physical designs in motels, hotels, restaurants, and bars. The important relationship between good design and good business is graphically shown in over 700 photographs, drawings and plans of successful establishments. The well-planned, practical design has—in each case studied—paid off in flourishing trade and satisfied clientele. The clear text gives expert answers to the hundreds of questions asked by owners and prospective architects, designers and investors in this important type of building. (1960)

327 pages, 8 1/4 x 11 1/4, \$9.75

## APARTMENTS AND DORMITORIES

by the editors of *Architectural Record*

In response to numerous requests for information on this building type, the editors of *Architectural Record* have selected 48 superior examples of apartment houses, college residence halls, and other multiple dwellings, designed by some of the world's leading architects. The buildings range in size from two-family houses to vast housing projects.

In addition to the buildings, there is a section containing useful technical information, and a series of studies on trends in apartment buildings and community development. Over 250 illustrations. (1958)

238 pages, 8 1/4 x 11 1/4, \$8.95

## ELEMENTARY STATICS OF SHELLS

(Second Edition)

by Alf Pflüger

This practical volume contains a simple and comprehensive presentation of the principles of shell theory. Designed to help the practicing engineer in the calculation of simple shell structures, it will also be of use to students as a supplement to classroom lectures. Primarily a graphic study of the spatial interplay of forces in shells, this approach permits the visual interpretation of equations. Once the basic equations are set down, their results can be interpreted easily in tables and graphs. Over 135 line drawings. (1961)

122 pages, 6 x 9, \$8.75

## EXHIBITION AND DISPLAY

by James Gardner and Caroline Heller

An eminently practical study in which every aspect of exhibition and display receives analysis and evaluation. Useful to those in charge of store displays and to those designing industrial or government exhibits up to international scale. This new book studies the problems of designing exhibits and displays that explain, create atmosphere, and sell.

Over 350 photographs and drawings showing exhibitions, good and bad, past and present, from nearly every region of the world make the analysis more graphic. Covers in detail such topics as: What a display can and cannot do, Displaying goods, Selling ideas, Catching the eye, Goods and services, Ideas and information. Analysis of 1958 Brussels World Fair. Anyone who plans or uses exhibitions or displays will find this new book a valuable guide. (1960)

190 pages, 8 1/4 x 11 1/4, \$13.75

## THE SELECTION OF RETAIL LOCATIONS

by Richard L. Nelson

This book contains the newest trends and techniques in site selection and potential volume analysis for stores, shopping centers, banks, restaurants and other establishments. (1958)

422 pages, 6 x 9, \$9.00

## DESIGN FOR MODERN MERCHANDISING

by the editors of *Architectural Record*

A detailed study of the physical design of stores, shopping centers, and showrooms. (1954)

247 pages, 8 1/4 x 11 1/4, \$8.95

## PLANNING STORES THAT PAY

by Dr. Louis Parnes

This book demonstrates the amazing degree to which good design speeds and increase sales in department stores and specialty chain stores. (1948)

313 pages, 8 1/4 x 11, \$12.75

## HOW TO BUILD MODERN FURNITURE

(Second Edition)

by Mario Dal Fabbro

Clear, easy-to-follow instructions for building your own professional quality furniture, plus step-by-step plans for 53 contemporary pieces, by a famous furniture designer.

The first section gives instruction in basic woodworking operations, selection of materials, joints, assembly, wood finishing, and upholstery. Standard measurements of all furniture pieces are listed. The second section presents 53 separate pieces: hi-fi cabinets, chests, tables, chairs, beds, and many others. Text is brief and clear—unique exploded diagrams do most of the teaching. Each project contains a list of materials and directions for assembly. Over 1200 diagrams and drawings. (1957)

224 pages, 7 1/2 x 9 1/2, \$4.95

## HOW TO MAKE BUILT-IN FURNITURE

by Mario Dal Fabbro

Step-by-step instructions for constructing 102 contemporary built-ins. This practical book presents unique sequence plans and illustrations which virtually eliminate the errors and mis-calculations which arise in these projects. All pieces can be built from standard grades of wood using common woodworking tools.

Included are pieces for living rooms, kitchens, bedrooms, play-rooms, attics and cellars. Hundreds of variations and adaptations can be made from these plans, and the book is also an excellent source of data for designing your own built-ins. (1955)

259 pages, 7 1/2 x 9 1/2, \$6.95

## DESIGN OF PRESTRESSED CONCRETE BEAMS

by William H. Connolly

A rational and clear-cut method for the design of pretensioned and post-tensioned concrete members. Through the use of design tables, emphasis is put on the reduction of the tedious trial and error normally involved in design problems. These tables are presented with explicit instructions that make this book uniquely practical. Contains over 90 illustrations of stress diagrams and cross-sections. (1960)

264 pages, 6 x 9, \$11.50

## PRACTICAL DESIGN OF STRUCTURAL MEMBERS

by Thomas A. Lucy

This comprehensive manual contains hundreds of time-saving short cuts and methods which are applicable to all conditions and requirements of stress analysis. Developed to meet the special design problems encountered by the structural engineer, this data is readily adaptable to any individual or office procedure. Contains hundreds of useful tables, charts, and diagrams, plus comprehensive analyses and discussions. Over 170 tables and charts. (1957)

432 pages, 6 1/4 x 10, \$12.00

## TIMBER DESIGN AND CONSTRUCTION HANDBOOK

prepared by Timber Engineering Company

The complete master handbook of timber design and construction written and edited by 34 engineers and timber specialists. Serves two purposes: it is a comprehensive timber design reference, and it is also a practical field handbook. Offers every bit of essential information needed to develop and construct the best wood structures.

The first portion covers the fundamental structural characteristics of wood. Lists types, grades, and ways of preservation. The next ten chapters analyze preliminary design considerations, design details, fabrication and erections. The final chapter presents 129 pages of design and engineering specifications and precise tabular data allowing easy conversion for particular grades and species. (1956)

622 pages, 6 x 9, \$12.75

## THE CONTEMPORARY CURTAIN WALL

its design, fabrication and erection

by W. Dudley Hunt, Jr.

One of the most important recent developments in the construction industry, curtain wall construction is still so new that there is a great demand for information on proper methods of design, construction and installation. Meeting that demand, this book presents, for the first time in one place, a wealth of information about this construction system.

Analyzes and evaluates the walls, their functions, their component parts, materials and installation. Lists and tables give all the known data about insulation, fire resistance, dimensional stability. Amply illustrated with drawings and photographs. (1958)

454 pages, 7 x 9 1/4, \$12.75

## BOILERS:

types, characteristics, and functions

by Carl D. Shields

A practical engineering approach to boilers and their selection, application, and performance. Intended to help all those involved in the specification, design, installation, and operation of all types of boilers, this book contains 32 chapters organized within 6 major sections: Boiler Classification, Boiler Design, Steam Generating Equipment, Boiler Construction, Industry Regulation, and Industry Status.

This up-to-date reference covers the experience of the entire industry. It will have specific appeal to stationary engineers, operators, installers, maintenance personnel, and buyers, sellers, and owners of boilers. Over 500 drawings and photographs. (1961)

566 pages, 7 1/4 x 10, \$15.00

## UNFIRED PRESSURE VESSELS

the ASME code simplified

by Robert Chuse

Revised, enlarged, and updated to cover current changes in Section VIII (Unfired Pressure Vessels) and Section IX (Welding Qualifications) of the Code, the new fourth edition of this practical manual presents complex vessel requirements and specifications at a glance. Contains 66 tables, charts, and diagrams designed to give complete, accurate Code calculations in just a matter of minutes. Greatly simplifies the work of designing, building, ordering, repairing and inspecting pressure vessels. (1960)

144 pages, 6 x 9, \$8.75

## CENTRIFUGAL PUMPS:

selection, operation and maintenance

by Igor Karassik and the late Roy Carter

A comprehensive reference book for users of centrifugal pumps throughout industry. Component parts, pump drives, performance characteristics, system-head curves, controls, and priming are discussed from the point of view of the buyer and user of pumping equipment.

Covering the entire field of centrifugal pumps, their appurtenances, and control, this work describes and thoroughly illustrates all types of pumps, including vertical, self-priming, and regenerative; it also discusses pumps for various areas of industrial service. This book will be of everyday use to anyone concerned with moving liquids or gases in bulk. The consulting engineer, specification writer, buyer, layout man, plant designer, operator, maintenance man, salesman or anyone concerned with centrifugal pumps will find this a valuable sourcebook. (1960)

480 pages, 7 1/4 x 10, \$15.75

## PLANT ENGINEERING PRACTICE

by the editors of Plant Engineering

The mammoth new reference work of plant operation and maintenance. Presents 226 separate case studies, each of which is designed to save time, work and money for the plant engineer and his staff, and architects and engineers doing industrial building work.

Written by over 100 experts in their fields, it is virtually an encyclopedia of practical, hard-earned experience. Organized into 13 sections: Sites and Layout, Construction, Housekeeping and Safety, Materials Handling, Maintenance, Plants and Protective Coatings, Mechanical Power and Piping, Electric Power, Lighting, Utilities, Heating and Air Conditioning, Quality Control, Shop-work. 12-page master index. Over 800 illustrations. (1958)

704 pages, 8 1/4 x 11 1/4, \$18.50

## INDUSTRIAL BUILDING DETAILS

by Duane F. Roycroft

The only master reference of architectural details for the industrial building designer. It presents over 1,500 detail drawings which have been proved in use by architects, draftsmen, and engineers. Each is sharp and clear, drawn precisely to scale, and is large enough to trace or protect for direct use or adaptation.

Every part of the contemporary industrial building is shown—from roofs and parapets to catch basins and manholes. Text is kept to a minimum, appearing only to introduce each of the seventeen major sections. Will save many man hours of tedious searching through files and folders. (1959)

352 pages, 8 1/4 x 11 1/4, \$12.75

## INDUSTRIAL ARCHITECTURE

by James F. Munce

An up-to-date, comparative survey of industrial building design in Great Britain, Germany, and the United States. Provides a stimulating review of the basic principles and newest developments upon which a factory design must be based.

Developments in such areas as design, use of master plan, employee movement, architectural character, and costs are considered. Attention is also given to the development of existing areas, the planning of new parks, and automation and factory design. Most useful of all are the chapters on the structure and fabric of the factory, and on services. These deal with general structural requirements, adequate day-lighting, maintenance, air-conditioning, lighting, sanitation and drainage. This original work will be welcomed by architects, engineers and contractors doing industrial jobs as well as business responsible for the planning and construction of new facilities. (1960)

240 pages, 9 1/4 x 12 1/4, \$14.75

## BUILDINGS FOR INDUSTRY

by the editors of Architectural Record

An outstanding selection of new industrial buildings, together with a series of informative studies on trends and factors in present-day industrial building design. 74 projects from all over the United States, as well as a few from overseas, are completely analyzed. Explains choice of site, plan, lighting, colors, loading docks and rail spurs, employee facilities, and many more features. Over 700 illustrations. (1957)

315 pages, 8 1/4 x 11 1/4, \$9.75



## BUILDINGS FOR RESEARCH

by the editors of Architectural Record

This timely book analyzes in detail a wide variety of research facilities—44 separate projects—built by industry, government agencies, and universities. Over 500 illustrations. (1958)

232 pages, 8 1/2 x 11 1/2, \$9.50

## ELECTRICAL EFFICIENCY IN INDUSTRIAL PLANTS

by E. S. Lincoln

A practical engineering guide to lower power costs. Designed to eliminate power waste and its resultant drain on industrial productivity. The author shows in detail the practical methods of making surveys of power load, voltage, and electrical protection—complete with a discussion of the necessary instruments and their use.

An analysis of power costs is included as well as all the elements in the distribution system. Such troublesome matters as power factor, choice of voltage, and equipment maintenance are presented directly and simply. Supplemented by helpful illustrations and tables. (1960)

235 pages, 6 x 9, \$9.50

## LANDSCAPE ARCHITECTURE:

*the shaping of man's natural environment*

by John O. Simonds

An articulate plea for intelligent landscape planning by a landscape architect who has drawn upon his years of study and world-wide travel, his practice, and his capacity for direct, clear statement. It explains what sensitive and sensible landscape planning is, why and how it can enrich our lives, and what we have lost through neglecting it.

The author begins his discussion by surveying the fundamental considerations: man, nature, landscape character, natural and man-made forms, forces, and features. He proceeds in clear, painless steps to build a framework encompassing the entire scope of landscape planning: Site Considerations, Organization of Spaces, Visual Aspects of Plan Arrangement, Circulation, Structures in the Landscape, and Planning the Region. Contains line drawings by the author, as well as a generous collection of photographs and sketches. (1961)

244 pages, 8 1/2 x 11 1/2, \$12.75

## GROUNDS MAINTENANCE HANDBOOK

(Second Edition)

by Herbert S. Conover

The only comprehensive reference work of grounds development and maintenance. Contains all the detailed information you need to plan, supervise and maintain grounds of every type and size.

It is a big book (503 pages), and fully illustrated. (over 175 illustrations). It consolidates all the needed information on planning, turf maintenance, planting and care of trees and shrubs, equipment selection, control of weeds, insects and diseases, materials specifications and erosion control. Throughout the book practical, economical methods and materials are stressed. (1958)

503 pages, 6 x 9, \$10.75

## THE ART OF HOME LANDSCAPING

by Garret Eckbo

Here is the book which helps the user recognize his landscaping needs, plan them on paper, substitute pencil work for shovel work, and eventually provide useful, beautiful outdoor space to the limits of his lot. Especially valuable to the new home buyer or builder, who cannot afford the services of a landscape architect, and cannot afford to make costly mistakes in his basic planning.

Covers in detail such topics as: Recognizing your needs, Plans, Scheduling work and money, Screenings, Walls, Drainage, Soil conditions, Solar orientation, Weather considerations, and many more. Profusely illustrated. (1956)

278 pages, 6 1/2 x 9 1/2, \$5.95

## LANDSCAPE FOR LIVING

by Garret Eckbo

The professional-level study of the purposes, problems and practices of landscape design. (1950)

268 pages, 8 x 10 1/2, \$10.00

## HOSPITALS, DOCTORS, AND DOLLARS

by Robert M. Cunningham, Jr.

A stimulating collection of reports and opinions on the hospital scene by the editorial director of *The Modern Hospital*. Keenly aware of what is wrong, and right, with hospitals, the author examines problems which are closely allied to the medical field: the high cost of medical care, labor problems, the emotionally tangled issues of socialized medicine, and the ethics of professional practice. On the lighter side, he includes anecdotes and stories on the memorable characters and events he has encountered in his years of reporting medical and hospital affairs. Anyone interested in the complexities and lighter moments of the medical field will find this book both informative and amusing. (1961)

288 pages, 5 1/2 x 7 1/2, \$6.95

## HOSPITALS, CLINICS, AND HEALTH CENTERS

by the editors of Architectural Record

Here, in one book, are the newest, most effective ideas for the planning of hospitals and other medical facilities. Divided into four sections, this valuable source covers almost the entire range of medical building types: hospitals, special facilities, rehabilitation centers, health centers, clinics, and doctors' offices. Contains sixty presentations and discussions. Each project studies a particular planning problem and its solution, and is graphically illustrated with interior and exterior photographs, floor plans, and diagrams. Includes authoritative technical articles on planning such specific elements as x-ray suites, pediatric units, and surgical suites. (1960)

256 pages, 8 1/2 x 11 1/2, \$9.75

## PLANNING THE SURGICAL SUITE

by Warwick Smith

This unique guide explains how the intended functions of a surgical suite affect its organization and design, and describes the methods of translating these needs into actual facilities. It prepares the way for a complete analysis of the function and design of the surgical suite; and considers the size, plan, and location of the clean and sterile supplies; sterilization; the detailed arrangement of the rooms, with particular emphasis on the major and specialty operating rooms and the recovery room; materials and finishes; heating, ventilating, and air conditioning; and engineering services. Contains numerous drawings and an exhaustive checklist keyed point-by-point to specific discussions in the text. (1960)

480 pages, 6 x 9, \$12.75

## PLANNING HOMES FOR THE AGED

by Geneva Mathiasen and Edward H. Noakes

The first comprehensive planning guide on the problems of designing and building homes for the aged and infirm. The editors—an expert in the problems of aging and a noted institutional architect—provide written and graphic assistance in the physical planning of such homes. Included are chapters prepared by eleven specialists on such topics as site planning, the residence unit, health needs and the infirmary, construction materials and costs, design and the function of the architect. (1959)

119 pages, 8 1/2 x 11 1/2, \$12.75

## NURSING HOME MANAGEMENT

by R. C. Williams, M.D. and others

The unique, complete handbook on the operation, organization, and management of nursing homes and similar institutions. Written by five authorities in the fields of public health, medicine, nursing care and administration, this book answers the unusual and the everyday problems of nursing home operation. It shows how to provide the best possible service while maintaining sound, economical business policy.

Eight chapters include establishment and organization, business management, medical and nursing care, recreational facilities, food service, housekeeping, buildings and grounds, and safety. Well illustrated with photographs, checklists, and informative appendices. (1959)

224 pages, 6 x 9, \$8.50

## SCHOOLS FOR THE NEW NEEDS

by the editors of *Architectural Record*

A graphic presentation of 66 school buildings from all parts of the country, which best demonstrate today's sweeping advances in concept and design. The result of today's pressing need for economy, all of these schools are working proof that sound planning can pay off in better school buildings at lower cost. Divided into 3 extensive sections: Cost Studies, Elementary Schools, Secondary Schools. Each section contains about 20 case studies, profusely illustrated with photos, plans, charts, and diagrams—over 900 in all. (1956)

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## SCHOOLS FOR THE VERY YOUNG

by Heinrich H. Waechter and Elisabeth Waechter

Beginning with a brief discussion of the development of child education, the book goes on to relate the daily pre-school activities to the environmental needs of the child and the teacher. Essentially a practical manual which concerns itself with design, layout, orientation of rooms, lighting, heating, ventilation, and other important considerations. 110 photographs, plans, and drawings included. (1951)

197 pages, 7 x 10, \$6.50

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by William W. Caudill

A common-sense approach to designing school buildings of all types, from elementary grades through college. It penetrates the maze of superficiality involved in school planning, gets to the heart of the matter in a lucid, thought-provoking manner. Contains 91 case studies of schools where adherence to an approach based on the specific problems involved has resulted in better schools which give the taxpayer the most for his money. (1954)

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by the editors of *Architectural Record*

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by the editors of *Architectural Record*

A magnificent collection of 44 contemporary houses superbly described by text, photographs, drawings and plans. They are examples of the spirit of originality and individuality that is becoming ever more important in mid-twentieth century architecture, and they are distinctive in the success with which they met the physical and esthetic requirements of their owners. Selected from the outstanding *Record Houses* annuals of 1956, 1957 and 1958. Ranging from the inexpensive to the luxurious, and representing the various climates of this country, these houses will furnish a genuine treasury of ideas to architects, contractors, and layman alike. 8 pages in full color. (1959)

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by the editors of *Architectural Record*

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by Pier Luigi Nervi

Pier Luigi Nervi of Rome draws on over 30 years of experience as architect, engineer, and builder. Contains much valuable information on the properties of "Ferro-cemento", which is a type of reinforced concrete developed by the author and used by him in the construction of some of the largest and most beautiful thin-shell concrete structures in the world.

Alternately practical and philosophical, the book considers such varied subjects as architect-client relations, training of designers and builders, theory of structures, and building in reinforced concrete. Contains photographs of all of Nervi's major works, as well as numerous sketches and plans. (1956)

118 pages, 7 1/4 x 9 1/2, \$6.95

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Eduardo Torroja, famous Spanish architect-engineer, has written a book which illustrates, describes, and explains the 30 most significant accomplishments of his career. These structures include bridges, dams, hangars, sports arenas, factories and churches. Many are of reinforced concrete—for Torroja's most unusual engineering feats are in prestressed and post-tensioned concrete—but wood, brick, and steel are used as well.

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## SUN AND SHADOW

by Marcel Breuer

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## THE CHAPEL AT RONCHAMP

by LeCorbusier

LeCorbusier's own account and explanation of the chapel of Notre Dame du Haut, which is one of the truly revolutionary buildings of our time. He presents the buildings in its 3 facets: as a place of worship, as a work of art, and as a practical exercise in architecture and construction. Contains notes and sketches in LeCorbusier's own handwriting. (1957)

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## *The Record Reports* continued from page 300

Although commercial buildings have become increasingly mechanical in their operation, costs continue to rise. This increase in automation, and the corresponding decrease in number of operating employes, indicates a need for good technical information. A survey made by the new Chicago firm reveals that architects and engineers would like better technical information for the operators.

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For effective coverage of good operating procedure, the firm plans to work closely with architects, engineers, contractors and manufacturers of installed equipment. For this reason they feel that the architects-engineers—the men who specify material and equipment—should contract and supervise the work, although compensation would ultimately come from the building owners.

### ADDENDA

Further information on the Idlewild story, published in ARCHITECTURAL RECORD, September 1961: Important contributions on the Northwest-Northeast-Braniff Terminal were made by Carl R. Kohler and Donald J. Newbauer, associates of White & Mariani, Architect-Engineers.

Louis Allen Abramson was architect of the snack bars and coffee shop and associated architect of the restaurant and cocktail lounge of the International Arrival Building. The Curtain wall units of the Arrival and Wing Buildings are framed in aluminum, covered with stainless steel on the exterior.

We regret the omission of credit to Ara Derderian for his renderings of I. M. Pei's Multi-Airline Terminal on page 168.

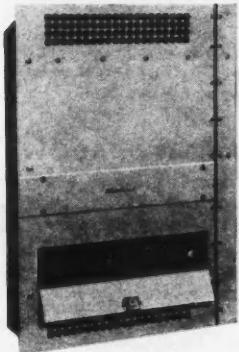
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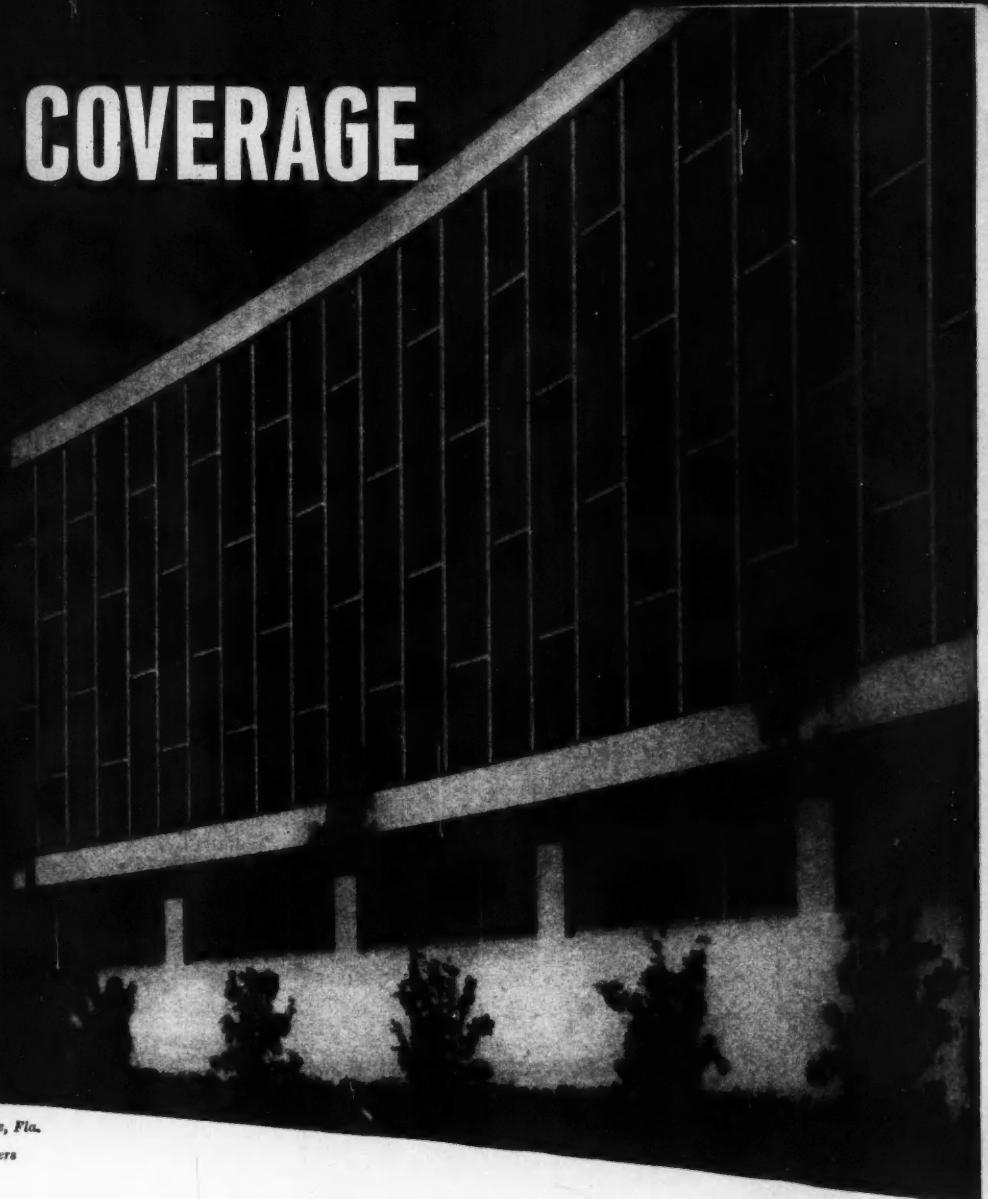
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ARCHITECTURAL RECORD, combined with American Architect & Architecture, published monthly at Concord, New Hampshire, for October 1, 1961.

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ROBERT F. MARSHALL,  
General Manager.

Sworn to and subscribed before me this 18th day of September, 1961. [SEAL] ELEANOR D. TONECKY, Notary Public for the State of New York, No. 60-9355240, qualified in Westchester County. Cert. filed in New York County. Commission expires March 30, 1962.

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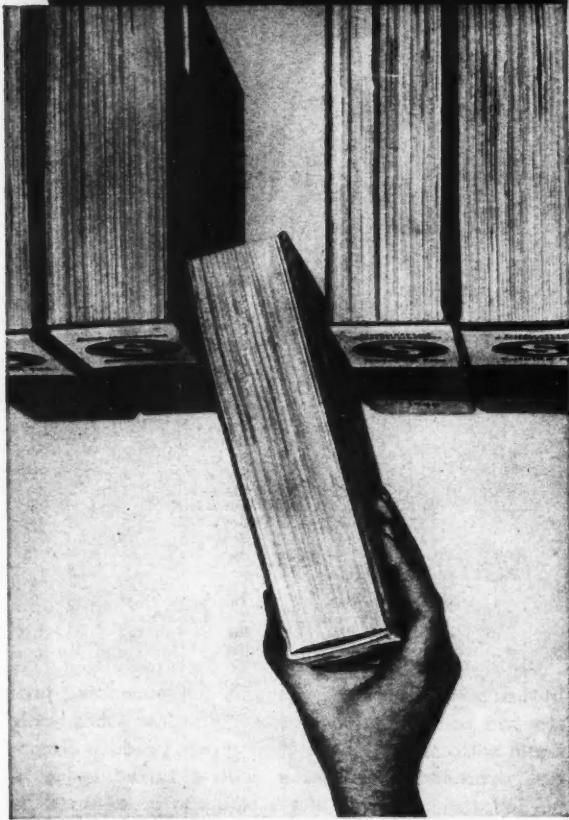
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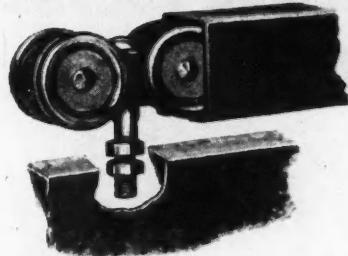


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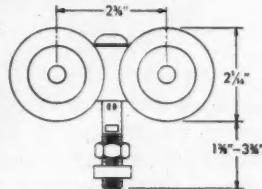


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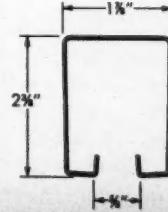
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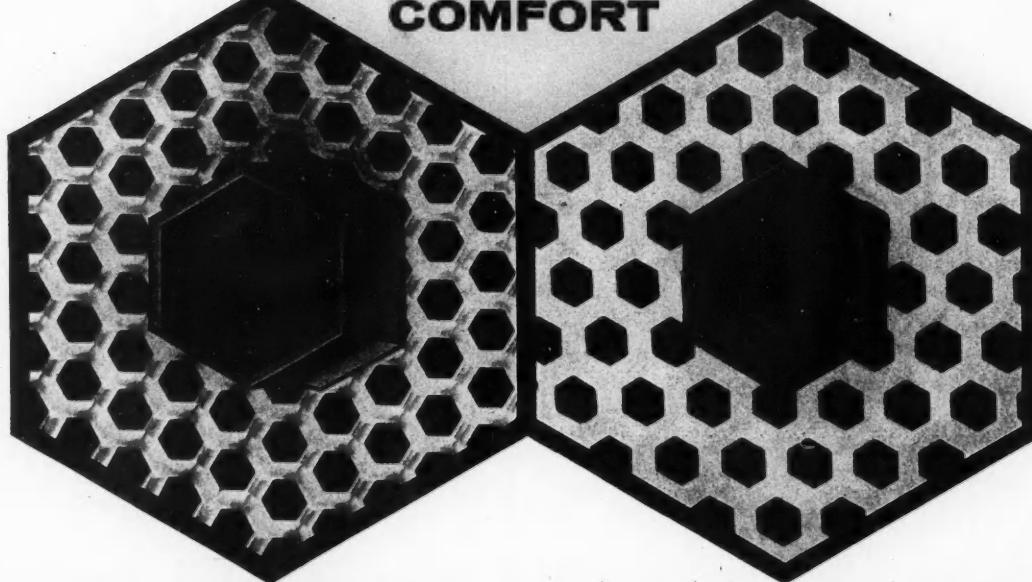
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